

Request for Proposals

Flushing Flows 2018

Upper Colorado River Wild and Scenic Stakeholder Group

Background

The Upper Colorado River Wild and Scenic Stakeholder Group Management Plan (SG Plan) was adopted by the U.S. Bureau of Land Management (BLM) and U.S. Forest Service (USFS) on June 12, 2015 to protect the outstandingly remarkable values (ORVs) identified by BLM and USFS for the Colorado River from its confluence with the Blue River to near Glenwood Springs, Colorado. The plan was proposed by and is being implemented as a Wild and Scenic management alternative by a stakeholder group (SG) representing a broad range of interests, including east slope and west slope water users, local government, state interests, conservation/environment/fishing, and float-boating. The SG Plan aims to protect all ORVs identified in the federal agencies' Eligibility Reports, while focusing on the streamflow-influenced Recreational Fishing and Recreational Boating ORVs. The SG's intention is to "balance permanent protection of the ORVs, certainty for the stakeholders, water project yield, and flexibility for water users."

The SG Plan identifies a number of ORV Indicators and Resource Guides in an effort to protect the ORVs. ORV Indicators are used to gage whether the ORVs are being protected. Resource Guides will be used as a source of information among others to inform the SG discussions under the Plan. Not all ORV Indicators and Resource Guides were fully defined at the time the SG Plan was developed. The SG plan states that additional work will be conducted during a provisional period (which is from June 2015 to June 2020) to finalize the ORV Indicators and Resource Guides (https://www.upcowildandscenic.com/uploads/1/2/9/6/1296822/20120110_upper_co_river_ws_mgmt_plan_alternative.pdf).

Purpose

This RFP is designed to address Recreational Fishing ORV Resource Guides for flushing flows. The SG reached consensus on the Suite of Conceptual Flows Table (attached), which defines the function (generally related to sediment transport) and objectives for each type of flow. This table should guide assessments of what flows are necessary to meet the function and objectives for each flow type.

Some work has been completed related to flushing flows and channel maintenance flows in the W&S segments to date. The SG contracted with consultants to collect bed material and other information to estimate flushing flows at 5 cross-sections in the W&S reaches between Pumphouse and Dostero (Beeby, 2014). Other assessments are expected to be utilized to

further refine magnitude and frequency of occurrence for specific flows important to meet sediment transport objectives. The primary known studies are referenced and linked or attached to this document. Other studies may be available that have not been identified.

Study Area

In the SG Plan, recreational fishing is identified to occur in W&S Segments 4, 5, and 6 which extends from the top of Gore Canyon downstream to Dotsero. This reach contains three USGS gages, the Colorado River near Kremmling (USGS 09058000), the Colorado River at Catamount Bridge, CO (USGS 09060799), and the Colorado River near Dotsero (USGS 09070500). All proposals should base assessments in this study area. Any field based studies should be focused between Pumphouse and Dotsero (W&S Segments 5 and 6), primarily because field work in Gore Canyon is likely not feasible. The SG has previously sampled for macroinvertebrates and collected cross-section and substrate data at the following five riffle locations. Proposals should consider data collection efforts in these locations if reasonable based on the methods proposed to evaluate flushing flows. However, studies for this RFP are not limited to these locations.

Site Description	County	Latitude	Longitude
Pumphouse	Grand	39.98471	-106.514
Radium	Grand	39.94985	-106.558
State Bridge	Eagle	39.85783	-106.647
Above Catamount	Eagle	39.91239	-106.785
Below Red Dirt	Eagle	39.70996	-107.047

Goal

This project will assess and/or determine the magnitude, duration, and frequency of flow components that affect specific sediment transport functions.

Flushing Flow evaluation

Background

The SG Plan includes a provisional Resource Guide for a periodic high flow. This provisional flushing flow is defined as, "A daily average flow of at least 2,000 cfs maintained for 3 consecutive days with a frequency of occurrence of once in two years on average." The SG plan states that the SG will monitor substrate, streamflows, and other conditions in segments 4, 5, and 6 to evaluate the adequacy of this provisional Resource Guide. The SG has reached a consensus on the definition of the flushing flow (see the Suite of Conceptual Flows), but has not evaluated the adequacy of the provisional Resource Guide.

Objectives

1. Evaluate the adequacy of the provisional flushing flow within the study area by implementing a study in 2019. Flushing flows move gravel-sized or finer sediment in riffles and maintain spawning habitat, clean substrate, and maintain interstitial space important for macroinvertebrates. The goal is to determine if the provisional flows perform the work of a flushing flow as identified in the Suite of Conceptual Flows. Proposals should determine if the provisional flushing flow value is effective through the entire study area.

If the provisional flushing flow is not sufficient to meet the definitions in the Suite of Conceptual Flows, then Objectives 2-4 are necessary. If the provisional flushing flow is found to be adequate, Objectives 2-4 will not be performed.

2. Determine what flow will perform the work of a flushing flow as identified in the Suite of Conceptual Flows in terms of magnitude, frequency and duration. It is assumed that field data collected implementing Objective 1., above, will inform this work.
3. Perform an analysis to determine how often the newly defined flushing flow occurred based on historical hydrology. This assessment should be based on the historical daily streamflow records available at the Colorado River near Kremmling gage (USGS 9058000, the "Kremmling gage") and the Colorado River near Dotsero gage (USGS 9070500, the "Dotsero gage") for the following study of 1983-2006 (Post Windy Gap) or 1983-present (to be determined by the SG).
4. Perform an analysis to determine how often the newly defined flushing flow may occur in the future. This analysis could be based on Denver Water's Platte and Colorado Simulation Model ("PACSM"), but other models that include the effects of current and future water developments (including Windy Gap Firming Project and the Moffat Firming Project) could be proposed for this analysis. The daily streamflow output from the PACSM model at the Kremmling and Dotsero gages will be provided by the SG for this assessment if requested.

The following objective should also be performed:

5. Propose a monitoring plan to evaluate if the flushing flow is meeting the definitions through time. This should include a proposal of what to monitor, the methodology, monitoring frequency, and indications that the flushing flow objectives are not met.

Requirements

There are many potential methods that could be employed to address these objectives. Methods could include empirical studies such as evaluating whether sediment moves using painted rocks, tracer rocks, underwater video, acoustic methods, and/or bedload measurements. Methods could also include modeling based approaches such as at-a-section,

1D, and 2D modeling to evaluate flows necessary to move sediment. A combination of empirical studies, modeling, or other methods could be proposed to address both the defined functions (generally related to sediment transport) and the defined objectives for each flow type in the Suite of Conceptual Flow definitions table.

Proposals should be as specific as possible describing the methods that will be used to address the RFP objectives including equipment, sample sites, sample schedule, sample parameters, and data analysis.

Proposals must be scientifically defensible and reproducible and will need to be completed within a short period of time. Final reports must be completed by January of 2020 to allow time for the SG to consider any potential changes to the SG Plan. This means that only one field season (2019) is currently contemplated. Proposals may provide higher and lower cost options to provide the SG flexibility in addressing flushing flows for a range of potential budgets.

Deliverables

- Draft/review and final version report in electronic format.
 - Report should include background, methodology, results, and conclusions related to the determining the magnitude, duration, and frequency of flows necessary to meet the defined function and objective for a flushing flow.
 - Maps of all field and/or modeling sites
 - Summary tables of data
 - Proposed future monitoring recommendations
- All raw data and analyses should be provided in electronic format.
- Presentation to the stakeholder group.

Proposal format

The proposal should contain a scope of work (SOW) including schedules and budget/cost estimates for each Objective. The SOW should include background to indicate understanding of the tasks and associated scope and description of the proposed work, and should reference any relevant field protocols, sampling protocols, laboratory procedures, quality assurance/quality control, etc. Detailed budgets on subtasks will help assess what work can be performed if the entire budget exceeds the amount of money the SG can potentially fund.

Schedule

Proposals Due: September 23, 2018
Proposals Awarded: January 2019 (pending SG decision)
Final Reports Due: January 2020

Project team

- List primary consultant and sub-consultants/labs
- Provide a statement of qualifications, résumés for consultants, and list similar past projects completed for each.

Terms

- Proposals will be evaluated based on a combination of cost, quality of the proposal, and the strength of project team experience. The SG will determine whether to move forward with any proposal, and contracting will be subject to available funding.

How to submit the proposal

Questions and proposals should be submitted electronically to info@upcowildandscenic.com.

Proposal due date: September 23, 2018

References

Beeby, J., Bledsoe, B., Hardie, K., Colorado River Inventory and Assessment, report prepared for the Eagle River Watershed Council.

http://www.erwc.org/wp-content/uploads/2014/01/CRIA_Final.pdf

Beeby, J., Bledsoe, B., 2014, Bed material and flushing flow analysis for the Colorado River in Eagle County.

<https://www.dropbox.com/s/8zye7fj1suzvcry/BedMaterialandFlushingAnalysisfortheColoradoRiverinEagleCounty%2CColorado.pdf?dl=0>

Grand County Stream Management Plan, 2010.

<http://co.grand.co.us/DocumentCenter/View/866/Draft-Report>

Miller, W.J., and K.M Swaim, 2011, Final Instream Flow Report for the Colorado River from Kremmling Colorado downstream to Dotsero, Colorado, Miller Ecological Consultants, Inc.

<https://www.dropbox.com/s/w46yudbm5snc5ho/Miller2011.pdf?dl=0>

Upper Colorado River Wild and Scenic Stakeholder Group Management Plan.

https://www.upcowildandscenic.com/uploads/1/2/9/6/1296822/20120110_upper_co_river_ws_mgmt_plan_alternative.pdf

**Upper CO River W & S Stakeholders
Channel Maintenance Work Group
Suite of Conceptual Flow Definitions⁶**

Table approved by Stakeholder Group consensus on _____

					ORVs ⁴		
		Function	Objectives	Flow Regime ¹	Recreational Fishing	Recreational Floatboating	Botanical (Riparian Plant Communities) ⁵
Currently Included in the SG Management Plan	Instream Flow	IN THE PLAN (See Paragraph IV.A.1) & DECREED IN CASE NOS. 11CW159, 11CW160, 11CW161					
	Seasonal Flow	IN THE PLAN (See Paragraph III.C.1)					
	Flushing Flow²	Flows that move sediment (gravel-sized or finer) in riffles	•Maintains spawning habitat for fish	IN THE PLAN (See Paragraph III.C.1.b)	X		
	• Maintains substrate and interstitial spaces for benthic macroinvertebrates		X				
Conceptual Flows	Channel Maintenance Flow	Flows that move bedload substrate (sand, gravel, and cobble) and which are typically similar to bankfull flows	•Maintains amount and diversity of aquatic habitat		X		
			•Maintains active channel geometry (topographic diversity)		X	X	X
			•Maintains capacity for flood conveyance			X	X
			•Creates and maintains non-vegetated sand and gravel features			X	X
			•Prevents growth of new rooted vegetation and/or scours rooted plants from active channel		X	X	X
	Riparian Maintenance Flow	Flows that inundate the riparian area	• Maintains the hyporheic zone through groundwater recharge, which affects in-channel water chemistry, temperature, and baseflow		X		X
			•Provides spawning and rearing habitat, foraging grounds and refugia for some fish species ³		X		
			•Facilitates the exchange of sediments and nutrients between riparian and aquatic zones		X		X
•Facilitates dispersal, maintenance and recruitment of riparian vegetation			X			X	

Notes:

The table above represents the latest work by the Channel Maintenance Work Group. Components of the table may be revised as the Stakeholder Group reviews additional resources and data.

- (1) As defined by N. Leroy Poff (1997, The Natural Flow Regime. BioScience, Vol. 47, No.11, pp.769-784.), the flow regime for each flow type includes the 5 components of streamflow (magnitude, duration, frequency, rate of change, and seasonality).
- (2) For purposes of the provisional period, the SG negotiated a provisional flushing flow Resource Guide which was defined as a daily average flow of at least 2000 cfs maintained for three consecutive days with a frequency of occurrence of once in two years on average (Stakeholder Group Management Plan Paragraph III.C.1.b).
- (3) Kondolf, G.M. and P.R. Wilcock. 1996. The flushing flow problem: Defining goals and objectives. *Water Resources Research*, Vol. 32(8): 2589-2599.
- (4) Recreational fishing (Segments 4-6) and recreational floatboating (Segments 4-7) are the primary streamflow-influenced ORVs identified in the Stakeholder Group Management Plan. Other ORVs, as defined by the BLM and USFS Eligibility Reports, include the following: botanical (Segment 6), scenic (Segments 4-7), geological (Segments 4, 5 and 7), wildlife (Segments 4-6), historic (Segments 4-5) and paleontological (Segment 5). See the table identifying the ORVs in Section II.A. of the January 2012 Upper Colorado River Wild and Scenic Stakeholder Group Management Plan.
- (5) According to the Stakeholder Group Management Plan, the Botanical ORV is classified as an *other* streamflow-influenced ORV, not a *primary* streamflow-influence ORV. While the SG Plan focuses on the primary streamflow-influenced ORVs, the SG Plan's implementation procedures provide a feedback loop to periodically assess and confirm that the management measures under the Plan, in coordination with the BLM and USFS other land management actions, are protective of all ORVs.
- (6) According to the January 2012 Upper Colorado River Wild and Scenic Stakeholder Group Management Plan (see Section III.C.1.c), "During the provisional period, the SG agrees to study the extent to which channel maintenance flow guides will be incorporated in the Plan. Discussions during the provisional period may result in the decision that no channel maintenance flow guides will be included in the Plan." Flows referenced in this table are conceptual and were developed to define maintenance-type flows. They may or may not be included in the final version of the Upper Colorado River Wild and Scenic Stakeholder Group Management Plan.