

Upper Colorado River Wild & Scenic Stakeholders Alternative Management Plan Long-Term Macroinvertebrate Sampling and Analysis Protocol

Frequency

Subject to funding, sampling for macroinvertebrates will occur every other year starting in 2021. This two-year sampling frequency does not preclude more frequent sampling based on unusual or significant conditions or events. This also does not preclude reduction of sampling frequency at some point in the future when the Data Review Committee and Governance Committee are confident that the natural range of variation in macroinvertebrate populations at the five sampling sites (identified below) is well understood.

Sampling & Analysis Protocol

Establishment of a long-term sampling and analysis protocol is necessary to ensure replicability and consistency. The sampling effort shall consist of two components: (1) macroinvertebrate sampling and (2) analysis of macroinvertebrate data. Any portion of the work may be outsourced, but proposals must minimally include sampling and analysis of macroinvertebrates. All sampling should be completed as per Colorado Department of Public Health and Environment's (CDPHE) most current guidelines and at the following five sites within the W&S segments:

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 Sweetwater ¹	Eagle	39.70996	-107.047

Analysis should include identification of macroinvertebrates to the lowest possible taxonomic level and calculate metrics to assess health of the aquatic macroinvertebrate community at each of the five W&S sites.

Macroinvertebrate sampling, identification and analysis, and metric calculation must adhere to CDPHE Standard Operating Procedures (SOP) and guidance provided in WQCD Policy 10-1 (WQCD 2017a or the most recently adopted version of this document):

- Appendix B: Benthic Macroinvertebrate Sampling Standard Operating Procedure
- Appendix C: Standard Operating Procedure for Laboratory Identification and Enumeration

¹ In 2022, the Monitoring Committee elected to change the name of the macroinvertebrate monitoring site from Below Red Dirt to Below Sweetwater to better correlate to its actual location and reduce confusion in relation to the stream temperature monitoring site at Below Red Dirt.

- Appendix D: Methodology for Determining Biological Condition

Additionally, macroinvertebrate sampling methods should adhere to WQCD Listing Methodology 2020 Listing Cycle (2019b or the most recently adopted version of this document):

- V. Determination of Attainment/Impairment E. Assessment of Biological and Physical Data
- Appendix D: Hess Method Sample Rules/Modifications (if Hess samplers are used for macroinvertebrate collections)

For additional guidance, see the reference section for a 2018 macroinvertebrate sampling and analysis study that was conducted by Timberline Aquatics, Inc for the Upper Colorado River Wild and Scenic Stakeholder Group.

Deliverables

- Standard Operating Procedure documenting sampling protocols, laboratory procedures, quality assurance/quality control, etc.
- Draft/review and final version report in electronic format.
- Presentation to the W&S Stakeholder Group.
- Multi-Metric Index scores as per the most current guidelines set forth by CDPHE as well as the full Ecological Data Application System (EDAS; a Microsoft Access database) output in Excel Spreadsheet format.

References

Rees, D., Musto, D., 2018, Benthic Macroinvertebrate Biomonitoring and Pebble Count Study, Upper Colorado River, report prepared for Upper Colorado River Wild and Scenic Stakeholder Group, Timberline Aquatics, Inc.

https://www.dropbox.com/s/3u07piqwrvrxu00/2018_Timberline%20Aquatics.pdf?dl=0