

DRAFT 19Nov22 AM

Supporting Document 5-1

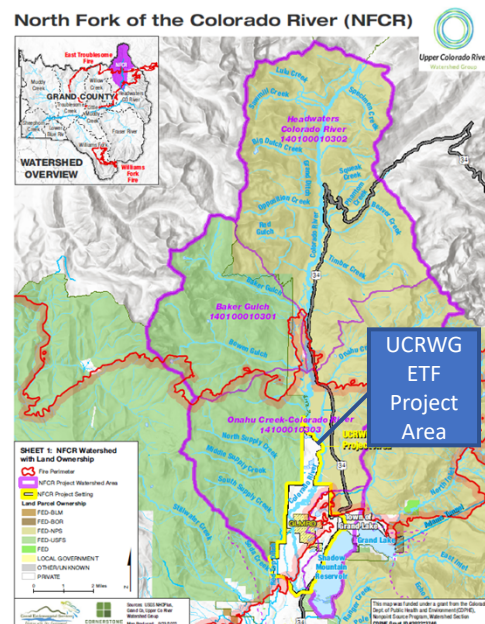
A Proposed Conceptual Model for Developing Water-Quality Credits for Stream Corridor Restoration along the North Fork Colorado River above Shadow Mtn Reservoir, CO CDPHE#2022-3746

Brief prepared for the Upper Colorado River Watershed Group
November 2022

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Proposed Conceptual Model

- Shadow Mtn Reservoir (SMR) was built to capture flows from the North Fork Colorado River as a key component of the Colorado-Big Thompson system (**Reference USBR SD80**)
- SMR has been receiving North Fork Colorado River (NFCR) flows as well as entrained sediment and dissolved constituents since it came on line in the 1950s (**REFERENCE**)
- The period since 1950s has seen enormous change in river corridor conditions including a) the almost complete collapse of extensive beaver communities, b) massive sediment loading from the 2003 blowout of the Grand Ditch and, most recently c) the East Troublesome Fire (**ETF Reference BAER?**)
- SMR is now listed as.....
- Aerial of delta???



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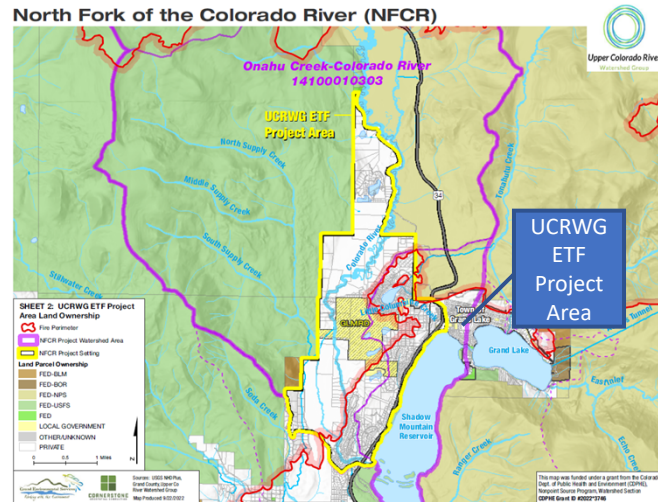
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Proposed Conceptual Model

NOTE CDPHE = Sed + nutrients Nti + P

- The Center for Watershed Protection offers a relatively simple model to guide development of water-quality credits for stream-corridor (or was it streambank?) restoration (Reference CWP 2021?)
- The FACStream assessment model offers a technically defensible, citizen-science-friendly approach to gaging stream-corridor conditions and improvements over time (Ecometrics 2016)
- We here propose a conceptual model to combine the CWP+FACStream approaches for the NFCR to guide future restoration work in the UCRWG ETF
- This supporting document is funded by:
 - ❖ (CDPHE) Nonpoint Source Program, Watershed Section Grant ID#2022*3746
 - ❖ Fire on the Mountain Foundation 2022
 - ❖ In-kind contribution from Grand Environmental Services



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Plan View Geometry

- The proposed model starts with a reference reach length (Lr) with some measured bankfull width (Wbf)
- We consider an additional Wbf on both sides of the reach for riparian processes, both overbank flooding (Reference HGM) and subsurface (conjunctive) flow Reference USGS Circular
- For water-quality credits we aim to optimize hydrogeochemical processes within the three polygons (Lr x Wbf) x model depth

Now thinking start with a photo of reference Reach with markup maybe Kaback?
So set up reader for HGM dynamics

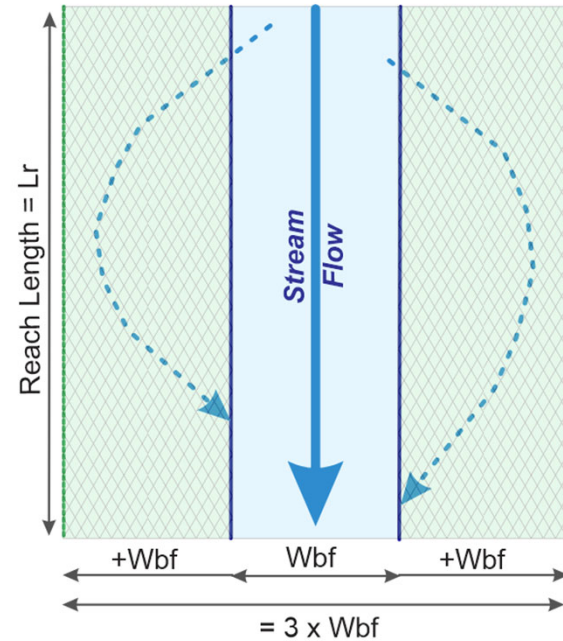
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Plan View Geometry

- The proposed model starts with a reference reach length (L_r) with some measured bankfull width (W_{bf})
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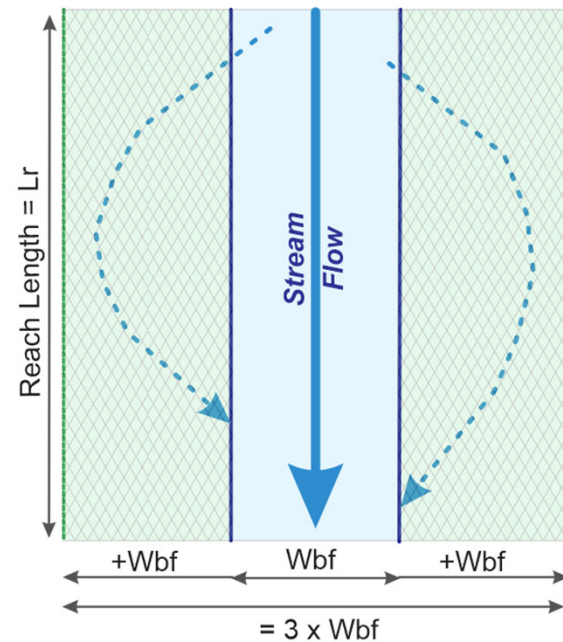
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Plan View Geometry

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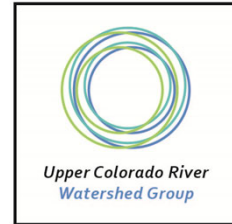


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Thank You, Happy to Answer Questions or Schedule Field Trip



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Photo of BRAT team at Gage

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References Cited

- This PPt especially, so basic reference in text then detailed citation here per Zotero

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