Comments on Revision

The authors have addressed some of the comments from the last revision, but several major concerns remain with the existing manuscript. First, some of the literature citations are inappropriate. For example, they discuss sedimentation modeling and use a reference to a hydrology-only paper that does not address sedimentation directly (see line comments below). Second, the authors failed to address the comment about a timeline of events, and this remains important. This could be done relatively easily with a few additions to Figure 9. For example, in addition to showing the sediment, the authors could simply add a secondary axis with rainfall intensity that shows the timing of the major storms. Crucially, I think the authors need to also show the timing of the completion of their "alluvial fan restoration areas" on Figure 9 as well. The third and final concern, is that the authors do not take the opportunity to explicitly compare observations with modeling. For example, everything in Table 1 appears to be a modeling result, but they have an opportunity to compare the model with observations. Same comment with Figure 9. That shows sediment observations, but it'd make sense to compare these with the modeling. I realize that the modeling and observations are obtained over different timescales, but you can sum the observations to the annual time scale and compare that to the modeling. Same comment with Table 3. Why not add a column that says "Sediment Retention Observed at Channel Design".

Right now my biggest concern is that this paper is a site-specific case study that does not have large application outside of the specific scenario. Moreover, I'm concerned that because the modeling is not compared to observations directly it's hard to evaluate how well these models actually estimated what was observed. Finally, I do not understand how the mitigation structures influenced/did not influence the sediment retention because I do not know when they were built with respect to the storms.

Line comments

29 I understand what you mean by sediment forecast here, but I don't understand what you mean by sediment forecast on line 28, where you say that "Sediment mitigation structures … are discussed as real-world applications of sediment forecasting…". I think this might just be a problem of language imprecision. I think you mean something closer to: "We discuss the real-world implications of using models to make sediment forecasts and using modeling results for the design of sediment mitigation structures." Either way, please refine this sentence because right now it sounds like you are saying that sediment mitigation structures are provide sediment forecasts, which doesn't make much sense.

34 Provide references to support this assertion, especially references that indicate that it is an "increasingly important issue", or change the language if that isn't something that is supported by research.

36. Sankey et al., 2017 is not a paper about flooding, and therefore you should adjust the reference. The word flood is not even used in that paper.

40. Ebel et al., 2023 (which doesn't have a year in your references) is about hydrology and does not specifically address these concerns: "damaging debris flows and sediment sourcing, transport, and aggradation". Here and elsewhere, please use references that support the assertions you are making.

46. Same problem as the last two. These references aren't really well suited for the points you are trying to support.

51. Either I'm confused about what you are referencing with Ebel et al., 2023, or you are confused. But I think you are trying to refer to this paper that is specifically focused on hydrological modeling and does not touch on sediment modeling at all. Is there a chance you are actually referring to a different paper?:

Ebel, B. A., Shephard, Z. M., Walvoord, M. A., Murphy, S. F., Partridge, T. F., & Perkins, K. S. (2023). Modeling Post-Wildfire Hydrologic Response: Review and Future Directions for Applications of Physically Based Distributed Simulation. *Earth's Future*, *11*(2), e2022EF003038.

62: Here you reference a conference abstract by Beers et al. 2023, and there is no mention of a loss in stream power or accretion upstream of neighborhoods in that conference abstract. Also, you inadvertently changed the title of that conference abstract, so I suggest you change it back to the original title. In any case, I don't think that the information in that abstract can be used to support the assertion here.

103 When you say that the flood events allowed for empirical comparisons to the modeled predictions be more specific. Do you mean you compared sediment discharge, volume, mass, flood velocity, etc? Specify to readers what exactly could be compared.

119: a 10-100 time increase in surface water runoff compared to what? Mean annual flow? Also, by runoff, do you mean discharge? Or depth? Be specific here.

126 There is something I don't understand about this: "Areas downstream from high sediment yield areas were identified as "work areas" …". I thought that the "work areas were specific mititation areas that were defined. This makes it sound like any area downstream from any other area with a high sediment yield is a "work area". I think you need to clarify this, and locate these areas on a map.

148: International readers of this European journal are likely not concerned about "who" estimated discharge, but I think they will be concerned about "how" it was estimated. So please include that information.

152: Are you saying that the floods incised the channels and then they will widen over time. Or are you saying that they were already incised prior to the fire, and will widen due to flooding. Please clarify.

154: here and elsewhere, when you are describing methods you have used, please use past-tense. For example, you say: "Sediment transport estimates are …", but that activity is over, so you should say "Sediment transport estimates were …". Same comment on 165 "sediment transport analyses are…" should be "sediment transport analyses were…"

207: Here you need to say the version number of the software, and provide a reference in your works cited.

214 say why you chose 1 inch, 2 inch and 3 inches per hour. Also, use "in" rather than a quote to abbreviate inches, as this will be more clear for an international audience.

223 I don't think you can use these words together " measured qualitatively" because if it's qualitative it's not actually a measurement. So change to something like "estimated qualitatively". Also, specify the difference between sediment and debris here. Is debris wood and trash? Say how it's different than sediment, or just remove the term debris.

234 after "…average annual sediment transport…" add units (e.g., Mg/yr) so readers know the units you are using.

243-244 I don't think you can justify this choice. In alluvial rivers the two-year return interval is often substituted for Bankfull, not the one year RI. Also what do you mean by "post-wildfire channel forming discharge" I don't think that's a concept that's been shown. What would be different about a postfire channel forming discharge versus a non-postfire channel forming discharge? Why is "channel forming" relevant here? If you think these choices have merit, then I think you need to explain them or point to literature that explains them.

257: You need to provide this information in a table somewhere and then reference it here: "bankfull cross- sectional area, Manning's n value, bankfull discharge, slope, suspended sediment (mg/L), measured bankfull bedload (lb/s), a flow duration curve, and a sediment rating curve comparison"

263 I'm a little lost on how you would use a "bankfull flow" if you are trying to estimate flow on an alluvial fan. Please explain.

285: Insteady of saying "G" channel, which is not a universally understood metric. I suggest you use a few short descriptions of the channel type. Something like "the channels are riffle-pool channels defined as "G" in XYZ scheme".

306 Avoid contractions like "don't" in scientific writing

367 Earlier you said there were four events. Please correct or explain the discrepancy. On line 24 it says "MUSLE predicted 4860 Mg/year (based on the four events)"

374 Again the reasoning for these choices of rain events were not justified. Please state why you chose those particular storm amounts/durations.

398 State if field observations confirm the modeling here. I think that readers will want to know if the modeling matches what was observed at those cross sections.

408 I think the critical question here is how do the modeling results compare to field observations. You have an opportunity here to compare model predictions with field observations, and that's the critical piece that seems to be missing.

416 This mention of the Pipeline needs more detail. How was the 70-80% measured? Was it repeat lidar, photogrammetry? Also, I think a critical piece is the timing after fire. Retaining 70-80% of sediment several years after the fire doesn't really say much about how the sediment retention structures would behave immediately after the fire. It is well known that wildfire sedimentation is typically highest in year 1 and goes down drastically in the following years as the watershed recovers.

450 What "hydrologic forecasts" are you referring to here?

501 I don't think that prior research supports this assertion that there will be "...substantial sediment loading for the foreseeable future..." it is well known that sedimentation rates after fire decline precipitously after the first year after wildfire. Within 3 years it is very unlikely that you'll continue to have fire-related sedimentation problems. Provide evidence that would support this point if you want to make this assertion.

507 Here and elsewhere, suggest replacing "poor conditions" with something else (e.g., transient or non-equilibrium conditions). I think you are trying to say that there is erosion or change, but calling it "poor" implies a judgement call on what is good/bad, which is really dependent on the observer.

514 Again provide evidence of how you measured 70% sediment retention on the pipeline fire. Also, I just looked up the Pipeline fire and I can see that it burned starting in June 2022. Did you have alluvial fans built on that fire to capture sediment in 2022? If so state the date of when those sediment retention structures were built with respect to the date of the fire and storms.

526 Again, the Beers et al., 2023 reference is just a conference abstract so there is no additional detail to be found on this.

527 Quantify what you mean by "moderate" and "long-term average"? Do you mean you retain 50% of the sediment or 98% and is this 50% of the long-term average measured using some dating technique or something else?

Figure 4. Somewhere, maybe in a supplement. Provide definitions for all of these channel types.

Figure 9. Please add rainfall intensity as a secondary axis on this so readers can compare the sediment mass per day with the rainfall intensity. You mention the four storms, but it'd be helpful to see where those storms exist in time compared to the sediment yield. Please also indicate the date that the alluvial fan restoration areas were completely constructed. You can do this with a single vertical line on the completion date.