Los Angeles River Instream Flow Criteria: Technical Study
Technical Advisory Committee Meeting (Webinar) #6
December 18, 2020

Meeting Objectives:

- Discuss approach for synthesizing flow recommendations
- Review sensitivity curve approach for scenario analysis
- Discuss how to incorporate analysis of stormwater capture

Meeting Time and Location:
December 18, 2020, 9:00 am – 12:00 pm
WEBINAR ONLY

Meeting Recording:
https://us02web.zoom.us/rec/share/hG5U8zv_XuyLIysZfADdh3vz69Zrk5YKSL_I7Mu8nD1KbE3S5pALM_P5NcpEwE-a.HwgFxIqn3kwRpwgm
Passcode: MI5qF89

Participant	Affiliation
AJ Keith	Stillwater
Alexander Prescott	
Andrew Collison	ESA Consultants
Anthony Hicke	ULARA Watermaster's Office
Chris Medak	USFWS
ChrisM	
Christine Wartman	LADWP
Dan Tormey	
Dean Wang	Long Beach Water
Dell'Apa Andrea	
Derek Booth	Stillwater
Dian Tanuwidjaja	Long Beach Water
Doug McPherson	USBR
Edward Belden	LA Mayor- LA River Works
Geremew Amenu	LADWP
Ginachi Amah	LARWQB
Hassan Rad	LA City
Heather Rhee	Long Beach Water Department
James Morgutia	
Jane Tsong	WCA
Johannes Beeby	
John Randall	The Nature Conservancy
koolk_000	
Manuel Aguilar	LADWP
Megan Schwartz	

Project Team:

Eric Stein	SCCWRP
Katie Irving	SCCWRP
Kris Taniguchi-Quan	SCCWRP
Terri Hogue	Colorado School of Mines
Jordy Wolfand	University of Portland
Elizabeth Gallo	Colorado School of Mines
Victoria Hennon	Colorado School of Mines
Reza Abdi	Colorado School of Mines
Daniel Philippus	Colorado School of Mines
Lori Webber	SWRCB
Tatyana Isupov	SWRCB

Melanie Tory	
Melissa Lane	
Michael	
Michael Affeldt	LA City
Milo Yukimoto	
Olivia	
Paul Cobian	
Romberger	CDFW
Rosi Daggat	RCD Santa Monica Mountains
Ruby (RK)	
Sabrina Drill	UC Extension
Sam	
Steve Skripnik	LimnoTech
Steven Webb	LARWQB
Travis H.	
Victor Ventura	
Wendy Katagi	Stillwater

Summary of Recommendations:

- Species Curves
    - SAS: change "probability" to "Probability range" or similar
    - Improve how we describe the probability curves to explain why they only go to 0.4
- Baseline conditions table:
    - Put NA for fry since we cannot sufficiently model edgewater habitat (e.g., Glendale Narrows)
- Final recommendations table:
    - Consider incorporating peak flows in Steelhead wet-season migration
    - Clarify what is meant by current conditions in the subheading
    - Clearly state caveats associated with recommendations
    - Cross-check recommendations against where spp. currently occur/are observed
- Sensitivity Curves:
    - Develop separate curves based on water year type
    - Change the x-axis to seasonal WRP discharge (absolute amount) as opposed to average annual WRP so time horizon on x and y axes are the same
    - Relate WRP discharge to probability of supporting species

Action Items:

- Will send out:
    - Meeting notes and materials
    - Revised current conditions report in January
    - Final recommendations report for TAC review by end of January
- Stillwater will share relevant steelhead flow modeling and LFA Conceptual Model excerpts so that projects are in sync

Meeting Notes:

Recap of Hydrologic Analysis:

- Sabrina Drill: Can you elaborate on the constant upwelling assumption in the model?
    - Eric Stein: In the model, we have assumed that current amount of upwelling is constant over time. We are not changing that value over time, it is set as a constant input in the Glendale Narrows portion.
    - Currently lumped into urban baseflow with urban drool, industrial discharge, and dams.
    - Sabrina Drill: Question relates to temperature regimes and the role of moderating temperature.
    - Eric Stein: we aren't going over the temperature modeling today, but could talk more on this at a later date.
- Chris Medak: Question regarding assumption that there's no groundwater infiltration associated with discharge. Doesn't seem like it matches reality for water use for plants. In the hydrology model, not simulating infiltrating into groundwater basin from surface flows, but we are accounting for saturation and inundation (shallow saturation of soil) important for seedling establishment for Willows.
    - Eric Stein: Groundwater basin source is coming from gw basins in upper watershed, but a lot of complex management of the upper basin due to controlling groundwater contamination plumes because of existing programs. No expectation that upwelling will change over time. In the model upwelling inflows will not change over time.
    - Anthony Hicke: The underlying geologic conditions in the ULARA groundwater basins are what control the upwelling of groundwater in Glendale Narrows portion of the LA River. That portion of the river is at a "pinch point" of the groundwater flow from the basin (the river crosses the distal, downgradient end of the San Fernando Groundwater Basin). Groundwater entering the river occurs because water bearing sediments (aquifers) are in direct contact with the alluvial sediments of the river. The static number for the volume of annual groundwater upwelling into the river that the modeling team has presented for use in the modeling work for upwelling inflow is reasonable because it matches the long term average of groundwater upwelling (referred to as rising water) reported in the Annual ULARA Watermaster Report. Further, those annual rising water data presented in the ULARA Watermaster report do not show great variability over time.
- Wendy Katagi: Can you expand on the incorporation of the tidal reaches?
    - We evaluated the current rating curve and need a dynamic rating curve that incorporates tidal influence. We will do a simple approach that uses HEC-RAS - will work on that over winter.

Review of Species Curve Development:

Species currently present:

- Wendy Katagi and others: Why is steelhead/rainbow trout migration only in Reach 1 as the fish would use all reaches in migration?

- Eric Stein: We analyzed migration for all reaches. The point is that the MIGR beneficial use is only currently designated for Reach 1 - but migration was evaluated for all reaches
- Sabrina Drill: Does this study include the Dominguez off channel wetlands?
    - Eric Stein: Dominguez gap is not included because it is not within the banks of the channel
    - Chris Medak: Are the habitats in Dominguez gap dependent on river flows?
        - Eric Stein: No, my understanding is that it catches storm flow but not overflow from the river. This will be confirmed with City/County of Los Angeles
- AJ Keith: For willow seedling depth curve, does depth here refer to depth of water in the channel or depth to groundwater?
    - Eric Stein: depth in the channel
- Edward Belden: How does the stream power for adult willow compare the discharges we see in Glendale narrows?
    - Eric Stein: We will discuss that a bit later, but I will bring it up during the break

Species not currently present:

- Sabrina Drill: For the sucker, with the highest probability at 0.4 for adults does that mean there simply isn't good habitat for the sucker in the project area (so probability of occurance is always less than half?)
    - Katie Irving: this curve is an amalgamation of different surveys, presence only versus presence abs, so it's hard to get for a true probability. This is based on the histogram. We know this is the likelihood is where species occur, but not this is where they would occur 100% of the time.
    - AJ Keith: In other words, SAS adults and juveniles use a variety of depths and velocities.
    - Eric Stein: as depth and velocity changes, what is the relative effect of a change in hydraulic condition on probability of support.
    - Rosi Daggat: Seems like a fairly conservative way of capturing a range of probabilities
    - Sabrina Drill: make clear in the write-up to explain this and change the y-axis label to be more explicit to this explanation
- Dan Tormey: How would the "extrapolation from systems that are dissimilar from the LA River" be conducted?
    - Katie Irving: Model was built from a different place, but the data that goes into the model is from the LA River
    - Dan Tormey: if you're building a curve in a sediment rich system compared to LA River, how would you modify the findings?
        - Eric Stein: simple answer is no, we are looking at flow and hydraulics in isolation of different factors that interact with the species. This is not accounting for interactions with substrate, we are strictly looking at flow/hydraulic conditions. Are flow/hydraulic conditions in the potential to support these species if all of the other habitat factors are supportive?

- Dan Tormey: this is a first order look so you can't be taking in all of the other factors in this study.

Habitat Modeling:

- On the critical time period table, add steelhead to migration cell to keep consistent with using species names

- AJ Keith: For adult steelhead migration, the functional flow component should include peak flows, or more specifically the receding limb of storm flows.
- Christian Romgerger: And would we not want to add peak flows to Steelhead Adult Migration?
    - Katie Irving: suitability criteria is over time, peak flows are quicker so may not have as large of an impact on suitability outcome as wet season baseflow but we can circle back with the group on how to include peak flows in recommendations.
- Wendy Katagi: Agree with AJ and Christian's steelhead migration comments. Also need to think about outmigrants as future populations increase.
- AJ Keith: Why would SAS suitability be low/partial in Glendale Narrows?
    - Katie Irving: this table does not present limiting factors for the low ratings but we added that into the current conditions report. Will look into limiting factors table and get back
- Sabrina Drill: I'm also a bit lost on the high probability for steelhead migration in concrete reaches – I can't tell if it takes into account the difference between burst swimming and constant swimming?
    - Katie Irving: means both burst and swimming is high suitability
- Chris Medak: Clarify that you cannot model edgewater so you will not be able to model habitat for sucker fry. Also, no accommodation for variation in flow within Glendale narrows associated with diverse topography and existing trees.
    - Eric Stein: It's likely low because we're not able to model edgewater conditions due to the resolution of our hydraulic model. We will update the baseline table and change to NA. May apply to adult and juvenile --> because we're not able to model the microhabitats and topography of the channel at the resolution that we need.
- Wendy Katagi: Steelhead fish passage design modeling can be shared with Katie and team as we are really focused on that limited window driving successful fish passage.
- **Action item:** Stillwater will share our relevant steelhead flow modeling and LFA Conceptual Model excerpts so that we are in sync. I know we've discussed, but just want to make sure.
- Andrew Collison: do the reaches include critical structures for migration e.g. bridge aprons? There are several of these downstream of the Glandale Narrows that are probably migration barriers.
    - Katie Irving: No, we're only looking at flow conditions, assuming everything else is okay
- Chris Medak: Question about willow data, the results indicated the lowest flow levels have greatest potential to support adults. How does this relate to the current condition (i.e., the level of water where we know the trees are supported)?
    - Under baseline conditions the dry season baseflow is currently over the 22 cfs limit at Glendale Narrows, closer to 80 cfs.
- Chris Medak: Back to groundwater upwelling, I wonder if the lower limit for willow is a result of assumptions for upwelling because it is not clear how the lower limit of flows would be distributed across the channel and still be able to support the willows, where they currently exist

Sample flow recommendations:

- Edward Belden: What is meant by current conditions in this table heading?

    - This table shows species that are currently observed or supported and we have a separate table showing species not currently supported in the system (i.e., Santa Ana Sucker and Stealhead)
- Dan Tormey: Consistent with our discussion related to this being a first effort, I would suggest that the flow recommendations table clearly indicate the scale of uncertainty that this first effort entails. Without this caveat, a user could infer that the flow recommendations are more accurate than they are.
    - Eric Stein: these will be ranges instead of a single number and the table headings will have the caveats of what we are not including.
    - Dan Tormey: make sure that your caveats/assumptions/limitations go with the final recommendations table and that these do not get lost.
    - Eric Stein: This table will be in the next report, so this is a starting template we're working with and will get feedback from you all.

Scenarios curve:

- Sabrina Drill: Is % flow reduction the best metric vs. cfs? We are likely to see changes in precipitation amount and timing in the next 15-20 years (per Swain/Hall) so I would keep with absolute numbers.
    - Kris Taniguchi-Quan: thanks for that suggestion, we will provide the absolute numbers in our final report, figures, and summary tables
- Rosi Daggat: Think you need to show both the flow and probability for each species so managers can identify conflicts
    - Kris Taniguchi-Quan: yes, we can provide both in our final recommendations report
- Geremew Amenu: For reaches that has multiple focal species, shouldn't combined curves be used as opposed to curves for individual species?
    - Kris Taniguchi-Quan: yes, we can provide sensitivity curves that include multiple endmember species.
- Chris Medak: should display each water year separately so that there may be an option to adjust flow releases relative to the type of water year
    - Kris Taniguchi-Quan: we can provide separate curves per water year type. We would love to develop a shiny app where users could interactively view the different scenarios, species, curves, and recommendations online
- Chris Medak: Should compare the modelled condition to the actual "current condition"
- AJ Keith: It would help with priorities and management decisions to relate WRP discharge to probability of supporting individual species and life stages, including those not yet (or not anymore) in the system.
    - Kris Taniguchi-Quan: We can provide sensitivity curves directly relating to probability of support
- Edward Belden: Is there a reason we have average annual WRP in the x axis and just dry season base flow on the y. Shouldn’t the time horizon on the x and y be the same?
    - Eric Stein: we could do it that way. We did look at the seasonal differences in WRP discharge and the interannual variability is fairly small, however we have the data to make these changes.
- Lori Webber: would there be one table per reach or per node?

    - Kris Taniguchi-Quan: Some reaches are homogeneous, so we would only need one summary table. Other reaches with more heterogeneous geomorphology, like Glendale Narrows, we have a couple of output nodes. We will likely provide summary tables for a subset of the 18 reporting nodes.
- Chris Medak: Should also look at change in extent of surface water across channel relative to difference in flow level
    - Eric Stein: yes, we can look at change in wetted width with our hydraulic outputs.
- Geremew Amenu: How is the urban flow estimated?
    - Jordy Wolfand: It was estimated from observed data from LA County and USACE, back calculated from the mass water balance → the remaining flow in the river that is not from direct runoff, WRP discharge, upwelling and dam releases.
- Rosi Dagat: Is there any thought of integrating water temperature changes that could be anticipated with lower flows?
    - Eric Stein: Yes, Reza from CSM has developed the stream temperature model but we did not touch on this topic in our presentation today.
- Lori Webber: how do you handle the WRP reduction estimates in reaches between the discharge points?
    - Jordy Wolfand: The WRPs each discharge into the river at their respective locations. For the 500 reuse scenarios, we put a multiplier to scale the WRP baseline timeseries. So, any reductions in the WRPs that drain to that node, will be propagated to that node.
- Wendy Katagi: Do you have a list of restoration opportunities we can review/provide input on? Our LAR Limiting Factors Analysis includes watershed-wide next steps and set up for other pilots in the Lower and Upper reaches of the LAR watershed. Can you explain why you are focused on LLAR restoration?
    - Eric Stein: our primary focus is on impacts due to changes in WRP discharge, which includes within the banks of the mainstem of the LA River.
- Geremew Amenu: How is dry-season defined?
    - Kris Taniguchi-Quan: It is calculated through the functional flows calculator (www.eflows.ucdavis.edu) and varies every year. It's based on a low flow threshold following spring recession and extends until the start of the next wet season. Statewide CA environmental flows framework: www.ceff.ucdavis.edu
- Sam: Is there a way to visualize the effects of WRP discharge reduction across different locations relative to a flow metric, or other ideas/tools for considering effects of discharge changes across related reaches? (also let me know if the reach definition makes this N/A)
    - Eric: Yes, we can create longitudinal profile plots that plot change in flow metrics as a function of position along the river. We could also potentially address this through a data visualization tool in the future.

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