CEFF Document Review – Response to Comments

Category of Comment	Comment	Response Category	Notes for Public
Other	This framework has a lot of useful information and guidance for setting environmental flow targets. We especially appreciate the explicit consideration of physical and biological constraints in Section B, consideration of non-ecological/human use water management goals and non-flow measures in Section C, and the emphasis on engaging informed experts and multiple stakeholders in an open and collaborative process in order to progress past a one size fits all approach to watersheds.	No change	
Consistency of language	"Step 1: Define ecological management goals" and "Step 8: Identify management objectives" Is there a rationale for this distinction between "goal" and "objective"? If so, this needs to be clarified otherwise consistency of terminology needed.	No change	
Clarity of document	Consider adding an executive summary	No change	
Clarity of document	4th paragraph "The Framework is divided into three main sections that guide users through multiple steps…" description on framework organization is redundant with what is covered in Framework Overview and Purpose section on page 2. It would be more clear to focus just on framework purpose first and then walk through the structure and steps instead of mentioning the structure multiple times.	No change	
Clarity of document	Section starting with “The hypothesis underlying Section A is that natural ranges of flow metrics for each of the five functional flow components will support multiple ecosystem function…” seemed a bit out of place in the introductory section, it might be better to fold this in to Section A itself instead. Possible to keep in this section if rephrased.	No change	
Clarity of document	Step B is actually an "if-needed" step, this should be made clear on the diagram either by labeling it so or consider a redesign of the graphic	No change	
Clarity of document	Fig 2.2 needs to be reworked- the spacing of the text is crunched too tightly together and the text flows over multiple columns that are not being used for any purpose	No change	

Clarity of document	What is the rationale for requiring LOIs be specified as defined by NHD version 2, medium resolution? can rationale be added? standard method, most comprehensive dataset available, most updated...	No change	
Other	The walkthrough of steps 1-4 are easy to understand and provide a good level of detail	No change	
Clarity of document	ditto comment on p 17- Fig 2.2	No change	
Ease of use for application	Generic conceptual model seems too high level to be of practical use as a starting point. Are there specific questions to pose to guide thinking?	No change	
Ease of use for application	Step 6 is the step where I get most lost in terms of visualizing what the outcome should be at this stage in terms of the specificity of what data has been collected and how the quantification of the relationships is used. Fleshing out the example more on this one could help, because it seems that the example provides only a small amount of clear and simple numbers that are applied at key places, and once again, getting to a point of scientific agreement on a small handful of specific numbers seems like a daunting task. Is there anything that can be added to the example that can demonstrate how to filter out too many metrics/ prioritize key metrics?	No change	
Clarity of document	Figure 4.4 needs a legend	No change	The Figure does have a legend
Clarity of document	The “Primer” on functional flows in Cal Rivers is good: clear and not too complex.	No change	
Clarity of document	This figure and its counterparts are excellent: very clear. The use of distinct and clear steps is very good.	No change	
Other	Ecological Management Goals are social constructs and thus are or should be social defined. At best they should reflect a social contract among those with interest in the watershed, including the plants and animals which are at home in the Stream. These be represented (voiced) by scientists or activists who explicitly take on or are assigned that role.	No change	
Clarity of document	The acronym “LOIs” is used extensively. I think it makes sense to write out the whole term the first time it is used in each section. Because some of the terms of art used are not familiar, perhaps it makes sense to include a bibliography of key terms at the start.	No change	

Other	Human individuals and groups setting “Ecological Management Goals” for streams raises ethical questions that are related to the rights of nature (rivers, streams). These questions should at minimum be acknowledged and perhaps discussed.	No change	
Clarity of document	Perhaps there should be more than one example representing more than one stream type that is tracked through the document or maybe included in an appendix.	No change	
Clarity of terms/definitions	A definition of “conceptual model” distinguishing it from other model types is needed.	No change	
Clarity of document	The blue box section on mediating factors in flow-energy relationships is excellent (clear).	No change	
Other	When discussing “quantifying indirect flow-ecology relationships” discuss the manner in which small errors can impact the sensitivity of the result. It will be necessary to define or explain model sensitivity so that everyone involved understands that small errors may multiply in a manner that the result could be right on the money or wildly off. Alternately, the discussion of flow model “sensitivity” could be in an appendix which is referenced in The text.	No change	
Clarity of document	The text reads “Water-quality parameters: Water quality parameters that influence ecological responses include temperature, turbidity/clarity, DO, contaminants, and others.” There is no good reason to use the term “others.” I strongly suggest you list them all.	No change	The list of potential parameters could be extremely long, this is only intended as a brief overview, not exhaustive
Consistency of language	The term “multiple stakeholders” should be changed to “all stakeholders” and a comment should be added about the importance of including all stakeholders and, especially, why it is not productive to exclude some stakeholders. This is important because of the practice in some rural watersheds of excluding environmental interests from so-called collaborative processes.	No change	
Ease of use for application	Finally, the Framework only includes an example based on a coastal watershed in Northern California. An appendix or separate discussion should include different regional considerations and scenarios, particularly when evaluating different flow alteration sources and hydrological regimes, based on region-specific considerations that reflect the water use and management reality faced in specific watersheds.	No change	

Other	The introduction appropriately mentions the need to clearly distinguish sociopolitical considerations from ecosystem water needs. P. 36 includes a very important reminder: "Decisions on how to structure the conceptual models and apply tools and quantitative methods will have a significant influence on the quality and nature of the results, and as such, should be developed through an open, collaborative process informed by experts and multiple stakeholders."	No change	
Clarity of document	Table 1.2 on P. 10 lists functional flow metrics associated with functional flow components. Stromberg and Patten (1990) have shown that annual water year volume of flow is significantly correlated with cottonwood growth in alluvial losing streams, and caution that "requirements of terrestrial vegetation may be greater than those of the fisheries." However, volume is not listed here. Average magnitude over time is a surrogate for volume, however these metrics don't include the mean, only median and other percentiles which don't directly translate into volume.	No change	
Consistency of language	Step 10 – check this section for conflation of ecological "flow criteria" with ecological "management goals" – I caught it at: P. 58 line 1 "that will make it possible to achieve ecological flow criteria management goals while satisfying other management needs"; P. 58 line 4 "If non-flow actions cannot satisfy ecological flow criteria management goals, flow-based management alternatives should also be considered"	No change	
Ease of use for application	Example A on p. 59 shows the risk of encouraging costly strategies that are ineffective in meeting ecological goals, which could result in valid complaints that water users gave up water and it didn't help the ecosystem. Some criteria are gradients where any improvement in flow helps, and some criteria are thresholds where improvement in flow doesn't help until a threshold is met. In this example, if the summer baseflow criterion functions as a threshold, then the non-flow actions are as necessary as the flow actions and communication with the stakeholders needs to be very clear that incremental improvements toward the threshold will not help. If it functions on a gradient, then any improvement in flow will help. This distinction (and potential pitfall) seems worth addressing in this section (e.g. Grantham et al. 2014).	No change	

Ease of use for application	The difference between “Identification of preferred management alternative” in Step 10 and “To select a preferred management alternative” and “develop the final set of environmental flow recommendations” in Step 11 seems to be the collaboration in Step 11. Could steps 10 and 11 be combined? Having this in two steps seems unnecessary/redundant, although maybe splitting is helpful, since Step 10 is analogous to developing an EIR and Step 11 would include circulating it for review and responding to comments and adopting a decision.	No change	
Other	I greatly appreciate all the work that went into this guidance and I am hopeful that it will help to facilitate identification or flow criteria for many rivers and streams in California. It comes at a critical time as many factors are converging to make the need for environmental flow criteria an urgent priority. My comments are primarily focused on ensuring that the guidance and the associated tools are user-friendly and that information is presented in a clear and easy-to-apply manner. I have also identified some inconsistencies in how things are described in various places in the document, its appendices, and the web tools. Many of my comments are regarding clarification and consistency for specific areas that I found confusing when trying to follow the guidance, and I hope my review will be help the team to provide clearer definitions of terms and processes in the public review draft. Please feel free to contact me with any questions regarding my comments.	No change	
Clarity of terms/definitions	Clearly define and use what "ecosystem functions" represent in streams/rivers. Salmon migration (especially, the rate of migration), sediment and large woody debris recruiement and relocation could be considered as ecosystem functions. Conductiviy and water temperature, of maintenance of them may not be considered as "ecosystem functions"; they are more of supporting chemical parameters for ecosystem functions.	No change	

Clarity of terms/definitions	It seems fish life histories, especially salmonids, are used as an example to describe the ecosystem functions and to establish "functional flows." Additional discussion regarding other aquatic communites, e.g., algal and macroinvertebrate community change and production, would be helpful for establishing environmental flows in streams that are not harboring large fish such as salmonids.	No change	
Clarity of terms/definitions	Physical changes during fall pulse flows: inundation of low-lying habitats and/or rewetting of channel margin habitats initiates the biogeochemical processes, i.e., nutrient recycling and flushing	No change	
Clarity of terms/definitions	Biological changes during fall pulse flows: Microbial, algal, and macroinvertebrate communities colonize and grow with the initial rewetting hydrologic events.	No change	
Clarity of terms/definitions	Physical changes during wet-season baseflow: increase longitudial and later connectivity,	No change	
Clarity of terms/definitions	Biogoechemical changes during wet-season baseflow: "Support hyporheic exchange" is a physical enhancement. Increased nutrient and organic matter recycling through decomposition and nutrient exchange between the surface and subsurface (or hyporheic) components of the stream/river would be proper biogeochemical ecosystem functions.	No change	
Clarity of terms/definitions	Biological changes during wet-season baseflow: Steady flows throughout the wet season could sustain the growth of algal and macroinvertebrate communities that would support the fish communities.	No change	
Clarity of terms/definitions	Physical changes during wet-season peak flows: Recruitment of large woody debris (from surrounding landscape into the stream) and relocation within the channel; restructuring of major in-stream channel habitats, such as construction and/or removal of debris dams, and creation and relocation of pools and riffles via sediment erosion and deposition during high flow events should be considered. In addition, "increased lateral connectivity" could further inlcude floodplain inundation.	No change	
Clarity of terms/definitions	Biological changes during wet-season peak flows: Growth and exchange of biological communities including fish and many food items, e.g., macroinvertebrates, are enhanced through the exchange between the stream/river channel and floodplain.	No change	

Clarity of terms/definitions	Biological changes during spring recession flows: "diversity" is not a functional parameter, please consider macroinvertebrate and algal growth (or production); "arthropods" are part of macroinvertebrates.	No change	
Clarity of terms/definitions	Physical changes during dry-season baseflow: Please consider including the protection and maintenance of hyporheic flows or groundwater inflows to disconnected pools (or any reach with water) to support species during the dry period.	No change	
Other	Recommend to use the following references: 1. W. J. Junk et al. 1989. The flood pulse concept in river-floodplain systems. 2. D. von Schiller et al. 2017. River ecosystem processes: A synthesis of approaches, criteria of use and sensitivity to environmental stressors. Science of the Total Environment 596-597: 465-480. 3. R. L. Vannote et al. 1980. The River Contimuum Concept. Can. J. Fish. Aquatic. Sci. 37: 130-137. 4. J. V. Ward. 1980. The four-dimensional nature of lotic ecosystems. Journal of the North American Benthological Society 8: 2-8.	No change	
Clarity of terms/definitions	Really nice to define ecological flow criteria and environmental flow recommendations upfront.	No change	
Clarity of document	General comment that the material is presented at a level of detail that is informative but also accessible to a diverse audience of natural resource professionals.	No change	
Ease of use for application	This is a really important document and reflects all the hard work everyone has put into it. Thank you very much for producing this useful document and I hope this framework is used widely.	No change	
Clarity of terms/definitions	"SECTION A (Steps 1-4): Identify ecological flow criteria using natural functional flows. Key question: What are natural functional flows for my location of interest? What are the corresponding ecological flow criteria?" Staff suggest changing "Identify ecological flow criteria" to “Develop ecological flow criteria”, as SECTION B states "Develop ecological flow criteria"; development seems to infer a larger degree of investigation and analysis than identification, which better reflects the efforts of those developing flow criteria.	No change	

Other	Ecological management goals should be consistent with existing laws including those described on page 51, as well as the Public Trust Doctrine and Reasonable Use Doctrine. The description of laws should be moved from Section C to section A Step 1 where goal setting takes place. This guidance document should specify when "the user" does and does not have an obligation to "determine ecological management goals" that are consistent with public-interest laws. We respectfully suggest that when the user is a state or federal agency, or is funded by a state or federal agency, the user shall set ecological management goals that are consistent with the ecological management goals already adopted by lawmakers and clarified by the courts. This will ensure that public agencies or public-interest organizations are able to enforce flow recommendations.	No change	
Other	This page reads: "When developing goals, the user should address regulatory requirements for listed species and water quality . . . " We suggest using more specific language when describing the relationship between regulatory requirements and goal setting. Words like "address" and "consider" should be replaced with more clear language such as "comply with" or "satisfy."	No change	
Ease of use for application	One of the outcomes listed on Page 19 is "A list of ecological management goals." It would be helpful if this guidance document provided examples of ecosystem management goals that are consistent with or satisfy existing law. Examples may include: recovery of endangered species; protecting critical habitat; ending take of endangered species from dewatering of streams; protecting instream beneficial uses and users of water; protecting Public Trust Resources in navigable waterways; and keeping fish below dams in good condition. The California Water Action plan provides a good example of how to set goals for instream flow studies that are consistent with the Public Trust Doctrine and Fish & Game Code Section 5937.	No change	

Other	This page provides the following example of ecological management goals: "The overall ecological management goal for the study area is to preserve stream health to sustain salmon populations. Specific goals are to maintain juvenile salmon rearing habitat and to protect passage flows for adult migration and smolt outmigration (Table A.2)." This example uses language that is weaker than, and distinct from, the goals enshrined in existing law. Studies based on this kind of goal tend to produce flow recommendations that are not enforceable.	No change	
Other	The laws described on Page 51 should be moved to section A Step 1 where goal setting is addressed. Please see our comments on Page 16 which relate to Page 51.	No change	
Clarity of terms/definitions	Does "limit longitudinal connectivity" mean provide a lower-flow limit? If so, then identifying a dry-season baseflow may not achieve this goal because continued flow recession could result in early disconnection of pools.	No change	
Ease of use for application	The document would benefit from further discussion and examples regarding the following variable aspects of the natural hydrograph important to salmonid habitat creation and suitability, including how each would be considered and ultimately realized in both regulated and unregulated watersheds: 1) multiple peak and moderate storm flows (peaks, duration, timing, recession) important for sediment movement, bar building, and maintenance of high winter groundwater levels, 2) sequence with real-time watershed conditions and tributary flows needed to maximize benefits of each component, and 3) realistic recession flows that continue through the dry season without the rate of recession being artificially truncated by water users.	No change	
Other	The California Department of Water Resources, appreciates the opportunity to provide input on this important work. This, however, should not be viewed as an exhaustive agency review, since some DWR sectors with expertise were not able to review this draft Guidance document. While we believe the concepts and overall approach hold promise for improving riverine and stream management, below you will find specific comments, mostly in the arena of underlying hydrologic computations that the Framework is built upon, as well as some suggested edits for improved communication.	No change	

Other	In concept, DWR supports the development of consistent, scientifically-supported “ecological flow criteria” to determine the range of flows within a given stream necessary to support the natural functions of healthy ecosystems. This approach appears consistent with other DWR supported collaborative efforts, such as Voluntary Agreements, that seek to utilize both flow and non-flow measures to maximize the ecological benefits of potential flow ranges, while also balancing the needs of other beneficial uses and water management objectives.	No change	
Clarity of document	The discussion here, focused on the 3 Sections of the Framework, could reference Figure 1-1 for increased clarity.	No change	
Clarity of document	The discussion here on Section A, beginning at the very bottom of page 2, assumes that only impairments would require special consideration for attainment of desired outcomes with the default natural functional flows metrics. The possibility of pro-active actions, already in place, that work the other way to enhance flow effectiveness should also be considered. For example, if a riverbank has been modified to enhance floodplain connectivity over and above what may have existed naturally. In other cases, deeper pools may have been purposefully added and maintained as heat stress refugia, potentially reducing the needed dry season baseflows that would otherwise be indicated. While such measures are addressed in the Framework, to “enhance the effectiveness of flow”, in steps 11-12 [page 60-62], they are couched only as future actions. DWR believes that this concept needs to be better reflected early in the text and the role for pro-active actions, either existing or potential, should be acknowledged so as not to have the Guidance appear biased in any way.	No change	
Clarity of document	Similar to the above, the discussion here on Section B assumes that only impairments would require special consideration; please include the possibility of existing pro-active actions that work the other way to enhance effectiveness.	No change	
Clarity of document	The text immediately following Figure 1.1 is perhaps some of the most important in that it is "The hypothesis" underlying this approach that relies heavily at the outset with ranges of natural flows. This discussion would benefit from a subheading of its own, something akin to "Methodological Rationale".	No change	

Clarity of document	Similar to previous comments, this discussion assumes that only impairments would require special consideration and DWR believes this should be noted or modified to also consider the possibility of existing pro-active actions that work the other way to enhance flow effectiveness.	No change	
Clarity of terms/definitions	The text immediately following Figure 1.1 says [slightly paraphrased for succinctness] "natural ranges of flow metrics … will support… ecosystem function …". Given that this Guidance may be applied to highly altered settings, it would seem more accurate to change the "will support" to "would have supported".	No change	
Clarity of document	This table may be too detailed as presented without the illustrative water year hydrograph as in Figure 1.3	No change	
Ease of use for application	Table 1.1: 5) If this Guidance were to be widely applied by non-expert audiences (which seems to be the intent of the 'worksheet' approach adopted later on), then it is easy to conceive of some difficulties arising with the terminology of the ecosystem functions column. For instance, 'longitudinal connectivity' might be better as 'reconnect isolated reaches' under the Fall pulse. Similarly, 'substrate' could be clearer to non-experts as 'river bottom sand and gravel'. The term 'hyporheic zone' would need some alternative language.	No change	
Clarity of terms/definitions	The footnote #2 here states that "Ecological responses are the ecological conditions that result from changes in streamflow and its effect on physical habitat, water quality, and/or biological communities". While the emphasis on 'changes' in streamflow would appear to a basic tenet associated with the Fall Pulse and Wet-season Peak Flows (as in rate of change and timing), it may not connect clearly for Baseflows. For baseflows, longer duration flows, which could be of constant magnitude, would provide many of the previously cited functions such as riparian zone moisture replenishment, or aquifer recharge. Perhaps a modified wording to reflect that both flows and changes in streamflow are important.	No change	

Consistency of language	There is some wording here that may confuse meanings and some previously couched cause-effect relationships. The first sentence says (in a condensed fashion): “flow criteria metrics … support functional flows … of a healthy ecosystem…”. Previously, functional flows were described as those which could support a healthy ecosystem. These functional flows are characterized by quantifiable metrics. This previous cause-effect linkage and descriptive language seems to be more appropriate in that the goal is to support a healthy riverine ecosystem, by maintaining functional flows, and these are characterized by certain metrics.	No change	
Other	The California Natural Flows Database appears to be a fundamental underpinning of this Framework and would be heavily relied on by a user as a principal resource to apply this Guidance. For a formal review, however, it is difficult to know how to address, since it is not explicitly something that is on a certain Page, Figure, Table, or even an Appendix. Thus, for review purposes it will be addressed based on the first page it is linked to (16) in the Guidance document.	No change	
Clarity of document	As stated in comments on the Introduction section, the discussion here in Step 3 on Section A assumes that non-flow alterations can only constitute limitations (previously ‘impairments’). Consider including existing pro-active actions that work the other way to enhance effectiveness.	No change	
Clarity of terms/definitions	The text immediately following “[Step 2: …,] Objective” states "To download natural functional flow metrics and characterize natural functional flow components." This is the first time the word natural has been directly used as an adjective attached to functional flow components. Previous usage was “functional flows” and that these could be characterized by natural ranges of functional flow metrics.	No change	
Clarity of document	The Functional Flow database/website graphical user interface (https://rivers.codefornature.org/#/map) includes a pop-up admonition that “predictions are currently in draft form and have not yet been peer reviewed.” Any resulting peer review should be made available for public review and comment prior to any action taken to adopt or recommend the CEFF for use in determining functional flows.	No change	

Clarity of terms/definitions	The text immediately following the highlighted box ending in “Appendix D“ describes functional flow metrics in the table below and refers to a single location [LOI] whereas the Table A.4 clearly has 2 LOI. The text appears to reference the values for LOI 2.	No change	
Clarity of document	As stated in comments on the Introduction section and elsewhere, the discussion here for Step 3 of Section A assumes that non-flow ‘degradation]’ can only limit the effectiveness of the natural functional flow metrics. Again, it would seem more balanced to also consider the possibility of previous pro-active actions that work the other way to enhance effectiveness.	No change	
Clarity of document	There are several places in this presentation where absolute thresholds are used in the detection algorithms. For example, a 0.08 cms [1 cfs] value is used in the identification of the Fall Pulse Flow [page 3]. This appears to be an example value from a specific stream implementation, but it is not described that way. If it is general, using a constant value for the entire state of California would not seem appropriate. At a minimum, it would seem that this value would have to be scaled by watershed area and/or stream order and/or other watershed parameters. Further explanation is called for.	No change	
Other	In the presented methods for calculating the Peak Flow and the Wet Season Baseflow, it is unclear if there is a segregation of these events, once identified, before subsequent characterization (e.g computing magnitudes). If not, this would amplify the influence of the peak flows leading to an upwardly skewed result for baseflow magnitude. The strict segregation of the resulting events was found important in other works in the field of ecohydrology using time-series hydrographs to derive environmental flow criteria [see Figure 4.2 and discussion in Texas Environmental Flows Science Advisory Committee, 2011. “Use of hydrologic data in the development of instream flow recommendations for the Environmental Flows Allocation Process and the Hydrology-Based Environmental Flow Regime (HEFR) Methodology” Report # SAC-2011-01. Austin: Texas Commission on Environmental Quality. http://www.tceq.texas.gov/assets/public/permitting/watersupply/water_rights/eflows/hydrologicmethods06172011.pdf].	No change	

Other	As noted above, there are many embedded and somewhat arbitrary parameters that must be specified for these algorithms to separate a stream time-series hydrograph into component parts. While specifying the many parameters is a necessary step for this process, such a specification-rich approach does raise the possibility that the results are potentially driven by one or more subjective choices. It would seem appropriate that the user of this process, be presented with an option to perform some manner of sensitivity analysis.	No change	
Clarity of document	Related to the above, the “list of measures” referenced in “Outcome of Step 11” is not expressly incorporated into Step 12, which focuses mainly on adaptive management and monitoring, but only expressly calls for management actions or strategies to achieve environmental flow recommendations. Suggest expanding Step 12 to include details on incorporating “measures to enhance the effectiveness of environmental flows or that avoid or offset adverse effects” and how they may overlap with adaptive management and monitoring.	No change	

Ease of use for application	The framework mentions that it "rests upon the scientific concept of functional flows" but was missing a discussion and/or comparison of what other scientific concepts were considered and why functional flows was found to be the best approach. This is worth adding in either the framework approach or primer on functional flows. Add to what extent a functional flow approach is/is not being used in management today. Especially given the desire to implement this framework into a consistent state-wide approach, a discussion of the roadblocks to implementation is needed, and one such roadblock is the preference some have to a single-species management/ unimpaired flow approach. Include in the intro a piece on how to iterate this process, suggestions on how to track what step in the process your LOI/study area is in and how to come back and reengage in this process as time goes on (for example- if the process must essentially pause in step 6 to create funding for and implement new data collection on flow-ecology relationships, how is it recommended that the steps are completed with existing data or with gaps in the data and then re-addressed and re-run through the steps later on given the challenge that the data collection/ scientific work is never done? Though I know no one can really have a great answer to this question, addressing this in the framework beyond a statement that it should act as a living document would be useful.	Addressed in FAQs	
Clarity of document	Related to need for clarity on intended users: Can there be added guidance or description of the different players expected to use this process and what roles they will play? What kind of subject matter expertise (or access to subject matter experts) are needed for this process?	Addressed in FAQs	
Ease of use for application	Some of the steps could use guidance on who is most appropriate to involve at what steps or at least language on involvement of stakeholders and key areas/places to generate feedback and input along the way. Stakeholder engagement is spelled out clearly in Section C with the structured decision making process, but needs to be addressed more in Sections A and B.	Addressed in FAQs	

Clarity of document	The definition of ecological flow criteria appears to be the full 10th-90th percentile range of flows that occurred at reference gages in streams with minimal disturbance over some period of historic record. That approach can generates a very large range of flows with no guidance on how to manage within the range. Some stakeholders will argue for operating at the most flow end of the range, others at the lowest flow end. Is the idea that as long as the stream is managed somewhere within the range, then the flow functions should be achieved barring other constraints? If not, then additional guidance on how to select the target flows within that range should be provided.	Addressed in FAQs	
Ease of use for application	For fall pulse flow event "flows between 30 and 180 csf" are defined by the 10th and 90th percentile fall pulse magnitudes. Question: so any flow greater than the 90th percentile is not considered a fall pulse flow? Need to clarify how this range is to be interpreted.	Addressed in FAQs	
Ease of use for application	In the first paragraph, it may be useful to provide additional guidance for those on the fence about whether they should fill out Section B for their system. Current guidance is that systems that have modifications that limit the ability of flow metrics to support desired ecological functions should fill out Section B. This seems like a sliding scale that will exist for practically every system to some extent. Are there some guiding questions/ a decision tree that could help people determine whether Section B applies to their system?	Addressed in FAQs	

Ease of use for application	Specify how downstream conditions will be taken into account in this model/context to inform the functional flow calculations. There are cases where the function of the historic natural flows is not achieved now because of a modified system and additional flows to meet natural levels would not be useful given current conditions. For example, flows recorded at upstream locations may not have historically made it all the way through the system since in places they would overtop the river banks, feed into the landscape, and then only some portion would slowly filter back into the channel. Incorporate more language on the way that a functional flows framework can capture the changes in flow needed in a system where downstream conditions vastly differ from historic conditions but may not have been built into a model extrapolated from upstream conditions. In addition, the framework should consider the intersection of other water management needs, such as the release of cold water to manage salmon below dams, and how these existing operations may alter flow in a different time scale than currently addressed here.	Addressed in FAQs	
Clarity of terms/definitions	Make it clearer that flow recommendations will not fully meet ecosystem needs, that is, that trade-offs are built into the system.	Addressed in FAQs	
Clarity of terms/definitions	Perhaps the system should include an “ecological flow bottom line” that is the minimum functional flows needed to sustain key watershed functions.	Addressed in FAQs	
Other	Will e flow recommendations always accommodate current levels of water withdrawal and use? If not, what procedures should be used to determiner which uses must be restrained?	Addressed in FAQs	
Other	There should be more discussion of the social side of the effort to secure functional flows because unless there is buy in from water users and use types the effort is likely to fail.	Addressed in FAQs	
Other	Consider adding a section at the end on “Next Steps” or “Implementation,” including: 1. best practices for community and stakeholder involvement, 2. Links to sources of technical assistance, including facilitation services, 3. Funding sources.	Addressed in FAQs	
Clarity of document	Perhaps there should be some discussion of state adoption of regional criteria pending development of watershed specific criteria.	Addressed in FAQs	
Ease of use for application	Consider adding a section on “knowledge gaps” and how to address them.	Addressed in FAQs	

Other	Who has the moral and the legal authority to define what is an “acceptable balance?” If stakeholders agree on flow objectives that result in, or are likely to result in, stakeholders agree on flow objectives that result in, or are likely to result in, extinction/extirpation of a species is that OK? Recommendation: Include a step that defines what constitutes an unacceptable outcome and/or triggers revisiting and potential change in flow objectives.	Addressed in FAQs	
Ease of use for application	Given the overarching goal and purpose of this Framework is to provide scientifically-defensible criteria when determining environmental flow recommendations, this framework and appendices appear to lack a discussion regarding the short-comings of models to accurately depict "natural" (or even current) flows. For example, some models have failed to account for groundwater pumping that affect flow – and result in much higher estimates than is observed on the ground. It is crucial that a discussion related to overcoming flaws in modeling (e.g., validation and ground-truthing) be included in Section B to improve the accuracy and defensibility of the flow criteria that result from this framework. (And prevent undermining the scientific basis of restoring flows, if the estimated flow is inaccurate or inflates existing conditions).	Addressed in FAQs	
Ease of use for application	Additionally, this Framework lacks discussion regarding validation of gauge data. As seen in select watersheds (particularly in Southern California), it is difficult to get an accurate dataset for low flow measurements. This Framework (the defensibility of flow criteria that result from this Framework) would benefit from a discussion on how (and highlight the need) to calibrate stream gauges.	Addressed in FAQs	

Ease of use for application	Table 1.1 on P. 6 includes in Fall Pulse Flow functions “modify salinity conditions in estuaries.” This is a function of ALL flows that reach the estuary, not just the Fall Pulse. It is well-documented that riverine inflow to estuaries often modifies salinity on a year-round basis, and that in many estuaries winter and spring are critical periods for many species and habitats. Also, the other estuarine functions of freshwater flow (e.g., transport of sediments, nutrients and organisms; cueing migratory behavior; etc) are not identified. It may be better to remove estuarine functions from the table and have a discussion about estuarine functions in a separate section. It could cover why estuaries are different, how estuarine ecosystems are shaped by volume, timing, and other attributes of the hydrograph,, and note that flow recommendations based only on riverine functions may need to be modified once downstream estuarine needs are considered.	Addressed in FAQs	
Ease of use for application	P. 16 references the California Natural Flows Database. The document should mention that use is not appropriate for estuaries (and perhaps the lower Sacramento River and lower San Joaquin River). Other cautions in using the database may be appropriate to include here, such as uncertainty in arid areas, disagreement with other sources of natural/unimpaired flows, and lack of sensitivity to climate change.	Addressed in FAQs	

Ease of use for application	The rational transparent decisionmaking process needs to have a clear articulation of non-ecosystem objectives. This framework sets a high bar for documenting the need for environmental flows, and this should be the same for non-ecosystem objectives. The document should acknowledge this needs to be addressed in the decisionmaking model. Step 8 (identification of management objectives) might also suggest how to prioritize them (incl. those important culturally, economically, or with a long history), and note the impact of each use on environmental flows and which ones are more or less in conflict with the natural flow regime, and assess which management objectives (ecosystem and non-ecosystem) are most sensitive (e.g., to risk of disruption or extinction). Stakeholders who bring unreasonable (i.e. unsustainable, harmful, or incompatible) management objectives and performance measures to the table should not be driving the discussion. This is addressed in Step 10 (p. 58), however Step 8 should be described as an initial proposal to be potentially modified in Step 10 (e.g. in Step 8 a water user could ask for 100% of their diversions, but in Step 10 identify reductions that result in a need for only 80%).	Addressed in FAQs	

Other	My main concern with the utility of this guidance is that it does not address, either conceptually or quantitatively, the impacts that climate change is already having and will increasingly have on flow regimes. Because these climate-driven changes in hydrology are already starting to occur, and are likely to increase significantly in the near future, this is a question that will come up when going through this process for pretty much every river and stream in California. If no guidance is provided on this, there is likely to be no consistency in how climate change is addressed when establishing environmental criteria for various rivers and streams. Is the intent that current flow regimes should match historical flow regimes, even for those streams for which climate change is the major factor impacting flow alteration? If so, does that mean that dams would be operated to attempt to counteract the impacts of climate change? For example, if climate change results in higher peak flows that occur earlier in the winter or spring, would dam releases be controls to try to simulate historical conditions? What about for less regulated streams where this is not possible - would this be a reason to construct new dams so that flows could be controlled to better achieve historical flow regiments? Or should the estimated values (and criteria) be adjusted based on incorporation of climate change scenarios, using downscaled models for each watershed, based on DWR guidance or some other guidance? If the models already used for estimating the natural flow metrics are made available and guidance is provided for incorporating climate change scenarios, it should be fairly straightforward for the user to carry this out. Of course, there would a lot of details to decide on regarding which climate change scenarios to model, etc, and methods are likely to change as things evolve over the years. But I do think this is extremely important to address, even if just conceptually at this point.	Addressed in FAQs	

Clarity of document	Limited guidance is provided on selecting the period of time that represents current flow conditions. The second paragraph of App J states only: "We recommend that at least 15 years of contemporary FFM values be used to evaluate their distribution (Kennard et al. 2010). Shorter periods may be acceptable if specific FFMs show limited variation, whereas longer periods of record may be warranted if specific flow metrics show a high degree of variation or indicate a trend towards higher or lower values over time (i.e., non-stationarity) (see Williams 2017 for additional guidance)." There is no discussion regarding what should be considered "current" in terms of changes to flow regime/water operations. It would be helpful to at least add a paragraph on consideration of when signification changes to water diversions or dam operations occured, as factors in determining the most appropriate period to represent current flow conditions for each watershed.	Addressed in FAQs	
Clarity of terms/definitions	Is there a minimum number of years for the period of record, especially to estimate the wet-season peak flows?	Addressed in FAQs	
Clarity of terms/definitions	Does the framework characterize dry-season hydrology as a “baseflow,” which is essentially a static flow value maintained throughout summer? Summer hydrology typically represents a continuation of the spring-flow recession, often producing the lowest flows of the year during early fall dependent upon climate and water source. This recession should be a continuation of spring recession generally, and should incorporate a management target of late-season environmentally protective low flows to support connection between pool habitats.	Addressed in FAQs	

Clarity of terms/definitions	Please clarify the reasoning that if only 50% of current values are within the 10th-90th percentile (and the median is within the 10-90% range of the estimated Functional Flow Metric (FFM)), the system would be considered unaltered. It seems a target representing a higher degree of overlap may be more appropriate. Additionally, using the described protocol to assess the current state of the hydrology in a waterway (i.e., "altered/unaltered/indeterminate") may present problems when analyzing summer baseflow. Summer baseflow throughout much of California may be depressed to such a degree that the range of recent data could be unnaturally small. Consequently, the median value and the upper half of the range could fall within the 10-90th percentiles of the reference-based FFM values, indicating the flow component was "likely unaltered," when in fact the consistently low summer flows year after year suggest otherwise (see example Figure). Furthermore, this analytical tool may not work well for Southern California watersheds when calculated results point to a conclusion that may not accurately characterize the magnitude of alteration (e.g., Appendix I, Figure 9, South Coast).	Addressed in FAQs	
Ease of use for application	The document would benefit from a discussion on suggested/potential considerations for addressing future climate change when developing environmental flow criteria.	Addressed in FAQs	

Ease of use for application	To improve the guidance document, we recommend a more informed, focused discussion on how an actual flow regime developed for a given year would be implemented, especially in the context of the example unregulated watershed as well as a regulated example. Guidance should encourage the user to ask the following two-part question: What hydrologic indicators (e.g., snowpack, precipitation, reservoir storage, inflow forecast, etc.) should be used to determine water year type, and how often should indicators be analyzed (e.g., weekly, monthly, annually)? For example, in most cases, environmental flows would likely be managed using either a "set" environmental flow schedule developed beforehand for implementation during different hydrologic conditions (e.g., water-year types), or adaptively via an environmental flow prescription that changes as in-season hydrologic conditions change. The former would require predicting the upcoming water year when planning and implementing the appropriate flow regime, whereas the latter requires forecasting future hydrologic conditions within a water year. How would the framework help manage reservoir releases in real-time, and with what indicators, in both scenarios?	Addressed in FAQs	
Clarity of document	In the first full paragraph on this page, there is a sentence that begins with “In 2018, …”. We recommend revising this sentence to read, “In 2018, the California Water Monitoring Council recognized the workgroup as an official Council subgroup, which will help ensure that the framework is to be optimally positioned for consideration by the California agencies that are target end users. The agencies can then evaluate whether the framework can be beneficially incorporated into their existing tools and strategies in a manner consistent with policy and legal requirements.”	Addressed in FAQs	

Clarity of document	This Appendix does not present the level of information needed to judge the adequacy of the presented summary results. No actual methodological steps, data, or discussion are presented. The results of this work, a regional hydrograph characterization, are utilized throughout the Guidance, as a basic organizational structure for many subsequent steps, such as assessing current alteration status (Appendix N). The need to augment the information of this Appendix is also compelled by the fact that the 3 given references, which appear to be fundamental, are behind publishers' paywalls.	Addressed in FAQs	
Clarity of document	2nd paragraph "...California agencies are the target end users." Last paragraph "expected user of the Framework is an individual or organization tasked with defining ecological flow criteria..." These two statements of the target ends user and expected user are not consistent. The first indicates guidance document is intended for CA agencies, but the second indicates a much broader user base. This inconsistency of intended user needs to be clarified.	Addressed in editorial changes	
Clarity of document	During workgroup discussions, there was emphasis on how this framework is not prescriptive and that there are hopes its use will be voluntary. This should be articulated explicitly in the document.	Addressed in editorial changes	
Clarity of terms/definitions	"Furthermore, a functional flows approach is not focused on the habitat needs of a particular species, but rather, is focused on identifying and preserving key ecosystem functions—such as sediment movement, water quality maintenance, and environmental cues for species migration and reproduction—that are necessary to maintain ecosystem health and that are broadly supportive of native freshwater plants and animals." Should clarify the benefit of an ecosystem-based approach over a single-species approach and clarify (if true) that this approach would not worsen conditions or further endanger listed species.	Addressed in editorial changes	
Clarity of terms/definitions	Define "natural ranges" here (or in the place it first comes up in the Section A bullet point at the end of p 3)	Addressed in editorial changes	

Clarity of document	Rephrase Table 1.1 caption to condense and clarify. Current description is awkward. Add clarification on role of the references – are these the places where the functional flow component has been demonstrated to effectively support the ecosystem functions listed?	Addressed in editorial changes	
Clarity of document	Suggest putting Table 1.2 ahead of Table 1.1, as it describes magnitude, timing, duration, etc., which are then referred to in shorter hand in the current Table 1.1	Addressed in editorial changes	
Ease of use for application	wet-season peak flow magnitude: What is rationale for the choice of 50%, 20% and 10% exceedance values and how are they to be applied?	Addressed in editorial changes	Lower flood exceedance values (2-year, 5-year, and 10-year) are those most commonly discussed in the literature and most often captured by large managed reservoirs in CA.
Clarity of document	Primer on functional flows – suggest moving this section earlier in the article, to be closer to when the concept of functional flows is first introduced on p 3. I like how this section stands on its own, but also I typically think of a call-out box as an optional read to further illustrate a point or to dive into a case study, but in this case the content within the call-out box seemed integral to the text as a whole, so it might be better to change it to a regular section rather than a call-out box, or to brainstorm other ideas to set it apart. Consider adding consistency/ redundancy by repeating the definition of functional flows first introduced (Yarnell et al 2015) or using the Grantham et al 2020 definition listed here in the introduction.	Addressed in editorial changes	
Clarity of document	Explain the significance (if any) of the colors in the conceptual model in Fig 1.2	Addressed in editorial changes	
Clarity of terms/definitions	Though stated in a previous section, remind readers who the “user” is in the Section A Overview	Addressed in editorial changes	
Consistency of language	"The predicted values of functional flow metrics are obtained from an existing statewide database." Since this is stated later on as the CA Natural Flows Database, why not just state it here instead of making the reader look elsewhere for this info? See other comments on the Natural Flows Database	Addressed in editorial changes	

Ease of use for application	The California Natural Flows Database was unable to load flow metrics for streams selected through the interactive map in Internet Explorer. Recommend adding a note regarding which browsers the application is compatible with. In addition, it would be helpful if a window popped up when you hovered over a stream segment displaying the name of the stream segment before you clicked on it to avoid accidentally selecting the wrong segment/stream. The TNC Natural Flows database includes the disclaimer that "Given the diversity of landscapes and stream conditions in California, the accuracy of metric estimates is expected to vary based on the physical setting of individual stream." This disclaimer should also be included in the Framework document. Based on a quick comparison with other estimates of natural flows for some stream segments (larger Central Valley rivers), considerable additional effort may be needed on the natural flows estimates for some stream segments to account for historical landscape structure and processes before they could be considered appropriate for use in developing environmental flows. While we only had time for a limited review of the flows database, it sounds like the metrics for all California stream segments were based on a limited number of reference streams. Suggest providing or describing the mechanism by which these estimates can be updated or modified based on a more site-specific evaluation of natural flow conditions. As currently written, it sounds like the recommendation is to use this database for all streams, regardless of the accuracy as described in the disclaimer. Suggest referring to the database as a possible basis for estimating metrics.	Addressed in editorial changes	
Clarity of document	Two "Step 1"s are listed in table.	Addressed in editorial changes	
Clarity of document	Step 1 (second)"you should ensure at least one function for each flow component" clarification needed, what is the rationale for this?	Addressed in editorial changes	

Clarity of document	STEP 4: "What are the ecological flow criteria for the functional flow components not identified in Step 3 as requiring additional consideration?" Rewording needed. Maybe simplify: "Which ecological flow criteria for the functional flow components do not require additional consideration (ie. not identified in Step 3)?	Addressed in editorial changes	
Ease of use for application	"The LOIs selected by user might include locations with:" - use of word "might" does not provide clear guidance. Is this a statement of mere preference or recommended that if these LOIs with these characteristics will make subsequent analysis easier?	Addressed in editorial changes	
Ease of use for application	"shoud identify at least one ecosystem function for each of the five functional flow components" - what is the user to do if this is not possible?	Addressed in editorial changes	
Clarity of document	'Example A' may be referred to with a different title as it is the only example in the document (there is no Example B)	Addressed in editorial changes	
Clarity of document	"Natural functional flow metrics can be viewed and downloaded at the CA Natural Flows Database" - clarify, if this data is available for all NHD segments?	Addressed in editorial changes	
Consistency of language	Multiple step 1 and step 2s labeled	Addressed in editorial changes	
Clarity of document	Second paragraph needs to be reworded for clarity. In particular, the sentence "The natural range of fall pulse flow, wet season baseflows, and the spring flow recession should be used to set ecological flow criteria (Step 4)." Should add a phrase that his is done because they are not expected to be impacted by non-flow factors that limit their functionality. The wet season peak flows and dry season baseflows are expected to be impacted by incision and temperature alteration so these need to be investigated further in Step B.	Addressed in editorial changes	
Ease of use for application	Step 3 and step 4 seem to be two outcomes of one action. It may be more clear to combine into one step: basically, categorize the ecological flow criteria that are impacted and need further investigation, the rest are the ecological flow critiera identified for this section	Addressed in editorial changes	
Clarity of document	Make clearer from the onset that this sample worksheet goes with Example A. Giving it the green coloration that Example A gets in other places or giving it a header up front may help.	Addressed in editorial changes	

Ease of use for application	Missing from the conversation on Step 5 is how to build consensus and determine the key mediating factors for any given goal. If the science is unknown or there is not agreement, then this fairly simple exercise could take years. This should be addressed. Additionally, in the way this step is described as “the user creates a conceptual model that represents all linkages between a focal flow component and ecological management goal(s)”, it seems like a very large number of these could be generated in order to capture all linkages. Consider what an appropriate range of how many individual conceptual models to create/ how simple or complex to aim. The example shows a very simple/ streamlined conceptual model but in practice it could be difficult to coral stakeholders into making a pared down model.	Addressed in editorial changes	
Ease of use for application	The Figure 3.2 generic conceptual model is too generic to be helpful in demonstrating the functional flow relationships. In addition, the example conceptual model in figure A.4 uses a completely different format and so does not inform how figure 3.2 could be used. Suggest making the two conceptual model figures consistent.	Addressed in editorial changes	
Clarity of document	Is a separate conceptual model needed for each functional flow component?	Addressed in editorial changes	
Ease of use for application	Mediating factor of water quality: This is assuming that flow magnitude should be adjusted to make up for the decrease in water quality. How can this process allow the user to consider alternative solutions that may address the temperature issue?	Addressed in editorial changes	
Ease of use for application	Step 10 Evaluate management scenarios and assess tradeoffs- There are many good suggestions here for tools to consider in the evaluation. Could a table be added here or in the appendix and referred to here that lists the tools and explains the difference between each/ what each are useful for? Also recommend adding something to the example on how the best assessment tool was selected in this case.	Addressed in editorial changes	
Clarity of terms/definitions	Suggest describing consequence tables in more detail and providing an example.	Addressed in editorial changes	
Clarity of document	Example A: Where is the trade-off analysis in this example? The trade-off analysis is a key part of Step 10, but it's guidance is not very clear. Can there be some plain language description of the options available and how to decide what process to use?	Addressed in editorial changes	Example included in Example A under Step 10

Other	Add to last bullet to read “Improve coordination and data sharing among management agencies, universities and NGO’s.”	Addressed in editorial changes	
Clarity of terms/definitions	Define “hyporheic zone.”	Addressed in editorial changes	
Clarity of document	Spaces between some words in the figure are needed.	Addressed in editorial changes	
Other	Consideration of “mediating factors” is qualitative and therefore best done via a public or collaborative stakeholder process so that there will be buy in. The topic of getting buy-in should, perhaps, be discussed in the Introduction because it is so critical to success.	Addressed in editorial changes	
Clarity of document	“California streams have five functional flow components” – this could say “most” CA streams have “up to” five; and add mention of exceptions: spring creeks, tidal channels, intermittent streams. It could be an opening to elaborate on the uniqueness of tidal areas.	Addressed in editorial changes	
Clarity of document	Table 1.2 on P. 10 lists functional flow metrics associated with functional flow components. Exceedance values are listed for some functional flow metrics, however it is unclear why some are chosen. For example, the wet season base flow uses the 10th percentile while the dry season baseflow uses the 90th percentile (both in addition to the 50th percentile). The reasoning for choosing a low wet season baseflow and a high dry season baseflow as metrics should be described.	Addressed in editorial changes	
Clarity of document	The example on p. 20 refers to an overall goal and specific goals, but this distinction is not discussed earlier. The document should specify that an overall goal of stream health always is identified in order to encompass all 5 functional flow components.	Addressed in editorial changes	

Clarity of terms/definitions	P. 38 defines ecological performance measures to be “quantitative measures of ecological conditions that are expected to respond (directly or indirectly) to changes in flow and that can be directly measured using standard monitoring techniques.” This definition not only should include conditions, but also should include processes. Conditions may be an adequate metric for relatively intact ecosystems that aren’t expected to change (or for direct biological responses to flow, or where mechanisms are poorly understood). However, for severely degraded ecosystems that may take a long time to recover, or in cases where the future is expected to look very different from the past, it may take a long time for conditions to reach goals, and in some cases goals may be unachievable. In these cases, goals should include the restoration of natural processes, which when combined with restoration actions, may allow desirable conditions to develop that can be sustained, and the system may even approach the trajectory of a pristine system over time (even pristine systems aren’t static and have trajectories). Setting goals for conditions (especially conditions that are historic and may no longer be sustainable, or even a perceived-to-be-achievable compromise condition) risks aiming too high or too low, and sets up the program for failure. Instead, specifying the processes to be restored that would support the desired conditions results in performance measures that are achievable and measurable. The mediating factors described in Step 5 and discussed in Step 6 (blue boxes) connect the physical process and the biological response, and ecological performance measures should be developed for all three—the physical process, the mediating factor, and the expected biological response.	Addressed in editorial changes	Text added to page 39: "Ecological performance measures could also be specified for intermediate links in the conceptual model, such as geomorphic processes or water quality parameters including dissolved oxygen, temperature, and contaminants. However, performance measures for intermediate links should be paired with measures for ecological outcomes"
Clarity of document	P. 51 (Step 8) contains a list of laws, policies, and processes related to environmental flows. It seems to overly focus on “species” – it says FERC relicensing can facilitate ecological flows “for species of interest” (but it should also note that these flows can also address geomorphic, water quality, recreational, and other concerns); it notes SGMA requires consideration of groundwater-surface water connections that support “priority species” (but it should also note that groundwater must be managed to protect all beneficial uses of interconnected surface waters, not just species).	Addressed in editorial changes	added general language to the paragraph preceding the list of regulations to clarify that this is not an exhaustive list and that the liste regulations have other benefits besides flow management.

Clarity of document	Appendix J states this alteration analysis is for non-peak flow metrics only. That should be stated in the document in Step 9 as well.	Addressed in editorial changes	
Clarity of document	The use of two different types of percentiles in the functional flow metrics is quite confusing. As someone new to the methodology, it took me a while to get my head around it, after going back and forth between the guidance document, appendices, and the two web tools. I am still not sure I am getting it quite right, and I imagine it might be even more confusing for someone with less background in hydrological modeling and statistical methods. I recommend that a clearer description be provided in the guidance document (in conjunction with Table 1.2) and in the California Natural Flows Database, and that footnotes be provided in tables and figures as needed, both in the guidance document and the website. The issue is that the different types of 10th ,50th (median), and 90th percentiles are used, and it is often not clear which is being referred to. In one case, the 10th and 90th percentiles are used to define the prediction interval generated by the random forest model models for each metric. In this case, for example, the 10th percentile value given refers to the median value of the 10th percentile values across all years for each model run, if I am interpreting correctly. These are the values represented in the “10th pctl”, “50th pctl”, and “90th pctl” columns in the tables generated for each stream segment in the California Natural Flows Database. "In the second case, 10th ,50th (median), and 90th percentiles are calculated as part of specific flow metrics. For example, the “wet season low baseflow” is defined in the California Natural Flows Database as “Magnitude of wet season baseflows (10th percentile of daily flows within that season, including peak flow events”, and in the eflows Metrics Calculation Documentation as “The baseflow magnitude of wet season is defined as 10th or 50th percentile magnitude of daily flow from the start of the wet season to the start of the dry season.” In this case, I assume that the “wet season low baseflow” in the California Natural Flows Database is calculated as the median value across all model runs, of the 10th percentile of daily flows during the wet season (median 10th percentile across all years 1950-2015). This seems consistent with the description provided in App D, which I had to dig into to find “FFM predictions were generated for every year between 1950 and 2015 for each segment. The quantiles (10th, 25th, 50th, 75th, 90th percentile) of segment-year predictions were saved from the trees. For each segment, the median	Addressed in editorial changes	

	value of each quantile across all years was then calculated." Similar potential for confusion exists for the metrics "Wet-season median baseflow", "Dry-season median baseflow", and "Dry-season high baseflow". I realize this is very challenging to describe accurately in a concise and clear manner that can be easily followed, particularly when trying to fit this into tables and figure. I have the following suggestions that might help clarify things for users: 1) Develop a paragraph to clarify this issue. Include it in multiple places (App D, in the CEFF guidance document in conjunction with Table 1.2, and in the California Natural Flows Database website (Science and Methodology page). 2) In the California Natural Flows Database tables generate for each stream segment, revise the definitions for the applicable metrics to something like this: "Magnitude of wet season baseflows (10th percentile of daily flows within that season (including peak flow events), across all years from 1950-2015 (median 10th percentile value across all model runs)" 3) Use consistent terminology between the California Natural Flows Database website tables and figures, and the metrics descriptions in Table 1.2, App D, and other places in the CEFF guidance document. For example, the California Natural Flows Database tables uses the term "wet season low baseflow" to refer to the 10th percentile of daily flows, but that that term is not used in Table 1.2 of the CEFF guidance, or in Table 3 of App E. Similar for other metrics defined by 10th or 90th percentile values. 4) For the functional flow metrics, be consistent in using the term "80% prediction interval" to describe the range between the 10th and 90th percentiles of estimated values generated for each metric. In the California Natural Flows Database figures for each stream segment, the term "confidence interval" is used, which generally refers to a different statistic generated for observed values, not predicted values. I realize that this is a little different for the metrics that are based on observed values at reference streams rather than modeled values, but I still think the term "prediction interval" more clearly describes what this range refers to.		

Clarity of document	Step 4: Select ecological flow criteria, second paragraph states “These ecological flow criteria are defined as the median (50th percentile) and 10th to 90th percentile range of the natural flow metrics for each flow component. The median represents the long-term value around which annual values should center. The 10th to 90th percentile values represent the lower and upper bounds, respectively, in which annual values of the metric are expected to vary. Ecological flow criteria can be defined for all water years, or by water year type.” I don't believe this is accurate based on my interpretation of the functional flow metrics and the criteria. It is not the observed annual values that should be centered around the predicted median, it is the median of observed values taken over a number of years. If I understand things correctly, I think the following language would be more accurate: “These ecological flow criteria are defined based on the 80% prediction interval of the natural flow metrics for each flow component (range of median values of model runs over the simulation period of 1950-2015). The estimated value, or predicted median (50th percentile), represents the long-term value around which long term median values should center. The 10th to 90th percentile values bound the prediction interval, in which long term median values of the metric are expected to vary. Ecological flow criteria can be defined for all water years, or by water year type.”	Addressed in editorial changes	
Clarity of document	I suggest adding the following italized language: "Current conditions are likely unaltered if the median observed value falls within the 10th to 90th percentile range of the ecological flow criteria and greater than 50% of the observations fall inside of the 10th to 90th percentile range (80% prediction interval)." Also applies for following bullets.	Addressed in editorial changes	
Clarity of terms/definitions	Terms need to be defined somewhere up front (prior to Table 1.2, and preferably in a definitions list that is easy to reference) and then consistent terminology used throughout to avoid confusion. This is especially true for terms used in describing metrics, as described in other comments. It would also be helpful to define these terms in the California Natural Flows Database website.	Addressed in editorial changes	
Clarity of terms/definitions	Biogeochemical changes during wet-season peak flows: Consider to include "nutrients and organic matter"	Addressed in editorial changes	

Clarity of terms/definitions	Biological changes during dry-season baseflow: "algal growth" and "primary producers" are duplicative.	Addressed in editorial changes	
Other	nice figure but some formatting issues with the text boxes.	Addressed in editorial changes	
Other	"Sustainable Groundwater Management Act (SGMA) and the Recycled Water Policy, which require consideration of “undesirable results” associated with groundwater management, including depletion of groundwater-surface water connections that support 'priority species'". Staff suggest separating the topics of SGMA and Recycled Water Policy into two bullet points since these are two separate programs. While there are opportunities for stakeholders to implement both programs simultaneously, the program-specific requirements are different, and there are different geographic coverages between the programs as well. Additionally, “undesirable results” are unique to SGMA. The Recycled Water Policy staff report only discusses them in the context of the nexus between the Policy and other programs. Staff suggest developing a separate description for the Recycled Water Policy and ask that you contact us if you would like to be referred to the program manager for more information.	Addressed in editorial changes	
Clarity of terms/definitions	"Sustainable Groundwater Management Act (SGMA) and the Recycled Water Policy, which require consideration of “undesirable results” associated with groundwater management, including depletion of groundwater-surface water connections that support 'priority species'". Staff suggest changing "depletion of groundwater-surface water connection that support 'priority species'" to " Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water caused by groundwater conditions occurring throughout the basin. ". (See WC section 10721(x).)	Addressed in editorial changes	

Other	SGMA requires local groundwater sustainability agencies (GSAs) to consider beneficial users and uses in their basins. Staff note that priority species are one beneficial user of water in many (or all) basins. However, it is up to GSAs to determine what constitutes a significant and unreasonable adverse impact, with plan review conducted by the Department of Water Resources. Staff suggest changing “that support 'priority species'” to a note that priority species are one of the beneficial users of water in many basins, and note that GSAs are required to consider the interests of all beneficial uses and users of groundwater, including environmental users of groundwater (see WC section 10723.2 and subsection (e)). Staff recognize that the Framework has potential to be a valuable resource for GSAs and interested parties working to address the undesirable result of interconnected surface water depletions as part of SGMA implementation. With this is mind, staff recommend that the Framework include more explicit connections to the SGMA process. One of these connections could be a discussion of how to identify interconnected reaches in order for GSAs or other agencies to protect areas where environmental flows are impacted by groundwater extractions. Additionally, it would be helpful for the Framework to expand on its explanations of ecosystem functions and ecological impacts by describing how groundwater extractions can result in losing reaches, which may impact riparian/in-stream ecosystems and groundwater dependent ecosystems. Please let us know if you would like to further discuss how this document could be helpful for stakeholders, interested parties, and other agencies involved in SGMA implementation	Addressed in editorial changes	
Clarity of terms/definitions	We suggest clarifying whether “absence of human activity” includes historic activity such as placer mining or just current-day activity such as active water diversions.	Addressed in editorial changes	

Other	The first page of Section C states that, when developing recommendations, "users must take into account numerous sociopolitical considerations that are often site-specific and non-scientific . . ." Instream flows quantified in Section A or B are not necessarily subject to the sociopolitical considerations discussed in section D. For example, flow quantities needed to prevent extinction of a salmon species, promote species recovery, or avoid take are not up for negotiation according to the letter and intent of the Endangered Species Act. Please amend the introduction to Section C to clarify when users should and should not adjust flow criteria based on sociopolitical considerations. For example, if a stream supports endangered fish, environmental flow levels must satisfy the Endangered Species Act regardless of sociopolitical considerations. See general comment below about equity and justice vs sociopolitical considerations in Section C.	Addressed in editorial changes	
Other	When identifying likely causes of flow alteration it is important to evaluate SWRCB's water rights database and to consult with local agency staff who may be familiar with diversions that are not registered with SWRCB. Diversions that don't show up in SWRCB's database include unlawful diversions and diversions conducted under riparian and claimed pre-1914 water rights.	Addressed in editorial changes	

Other	Incorporate Equity & Justice into Section C Section C is based on the premise that users must account for "non-scientific" "sociopolitical considerations" and "social values" before providing flow recommendations. We are concerned that, as written, Section C will preserve historic power inequities that favor out-of-stream water users over stakeholders who depend on instream flows for food, jobs, health, recreation and cultural survival. We encourage you to integrate the principles of equity, inclusion, and justice into section C. Please take steps to include stakeholders with values that have traditionally held less power in water allocation decision-making. This includes Native American tribal members who depend on instream flows, youth who are facing a future without salmon and other important species, and stakeholders who value non-humans and the web of life.	Addressed in editorial changes	
Other	Clarifying "human water needs" Language throughout the guidance document implies that "human water needs" are distinct from ecological flows. Please refer to pages 1, 2 and 3, the introduction to Section C, and several places in between. We suggest using the terms instream and off-stream water uses. Ecological flows are a human water need. They provide numerous instream beneficial human uses such as fishing, swimming, and recreation. Instream flows support ancient cultural traditions for many of California's Native American Tribal members. For river-dependent communities, lack of instream flows are literally causing hunger, as well as physical and mental health problems. Instream beneficial human uses of water are supposed to be protected by the Public Trust Doctrine, Endangered Species Act, Clean Water Act and other laws. To protect these human uses of water, we must have instream flow studies that quantify flow levels needed to satisfy existing law.	Addressed in editorial changes	

Other	Climate Adaptation & Flow Baselines This guidance should address the impacts that climate change is already having and will increasingly have on flow regimes. Without such guidance, there is likely to be no consistency in how climate change is addressed when establishing environmental flow criteria for various rivers and streams. As a starting point, we suggest using the Department of Water Resources existing climate models to project future flow patterns and adjust criteria so that goals can be achieved despite changing flow regimes.	Addressed in editorial changes	
Ease of use for application	Table 1.2 presents Functional Flow Metrics for wet-season peak flows as the 2-, 5-, and 10-year recurrence interval storms, but Example A only uses the 5-year metric. A discussion of why the 5-year recurrence storm was chosen for the example would be useful, as well as under what circumstances considering the 5- and 10- year metrics may be more appropriate.	Addressed in editorial changes	
Clarity of terms/definitions	We recommend adding the bold text into the following sentence found on page 11 of the guidance document: “High and moderate flows move sediment and wood, modifying stream channels, and creating structural complexity….”	Addressed in editorial changes	
Clarity of document	The first sentence here would imply that all California streams have environmental flow commitments that are being managed by various entities. Suggest modifying, perhaps expanding, this introductory definition of environmental flows [the balance statement] before the discussion moves on to the complexity of processes and constraints on existing tools and management authority. Text that describes these as a balance between ecological flow criteria and other water management objectives, as opposed to simply “human needs” is near bottom of page 2 after “environmental flow recommendations”.	Addressed in editorial changes	
Clarity of terms/definitions	Table 1.1: 1) This is an impressive and authoritative presentation of supporting literature for environmental flows. However, it may leave a reader with some questions about the intent and scope of the table: 1) Is this a general tabulation of environmental flow attributes and characteristics or is it explicitly looking at just California streams? In other words, should the caption contain the word California before the words “functional flows”?	Addressed in editorial changes	

Clarity of document	Table 1.1: 2) This table, presents a lot of information; to increase readability the caption can be expanded. The text starts off describing the third column, whereas it could start at the beginning focusing on the five functional flows.	Addressed in editorial changes	
Consistency of language	Table 1.1: 3) The caption of the table describes the 4th column as “types of flow metrics” whereas the heading of the 4th column is “Associated Flow Characteristic”. These should be consistent.	Addressed in editorial changes	
Clarity of document	Table 1.1: 4) The current caption describes just the 3rd column as being an ecosystem function, whereas that is the subject of columns 2 and 3.	Addressed in editorial changes	
Clarity of terms/definitions	Table 1.1: 6) Questions arise regarding the scope and intent of this table if the detailed entries are examined. For example, referring to the entries in just the "Fall Pulse Flow", under the "Biological" Type of Ecosystem Function the aspect of "timing" is listed as important [as a spawning cue]. However, above this under "Biogeochemical" Function, again for the “Fall Pulse Flow”, there is an entry for "Modify salinity conditions in estuaries." Here only magnitude and duration are cited as important aspects and timing is given no weight. This would seem to be a highly presumptive level of certainty about this particular beneficial aspect of this functional flow and, in fact, there is literature [1] that would suggest that specific salinity regimes and timing thereof are always important aspects of freshwater inflows to California estuaries, supporting outmigration. There are likely other additions or modifications that could be made to this detailed table.. The over-arching question is - is this intended to be an exhaustive list or would it be more appropriate to modify the column label “Associated Flow Characteristic” with the word “Example” or “Known” before Associated? [1] Drinkwater, K. F. and K. T. Frank. 1994. Effects of river regulation and diversion on marine fish and invertebrates. Aquatic Conservation: Freshwater and Marine Ecosystems. 4:135–151.	Addressed in editorial changes	clarity regarding the references listed added to caption.

Clarity of document	This table seems to be misplaced in the document. The first reference to it is not until page 14, 4 pages further on in the document. And that reference is from within a special section, which appears that it could be a stand-alone subsection called “A primer on functional flows on California Rivers”	Addressed in editorial changes	
Clarity of document	Much of the discussion appearing in this special subsection “A primer on functional flows on California Rivers” seems a pre-requisite to fully justifying and explaining many concepts that were put forward, earlier in the document. For instance, this ‘primer’ discusses how the attributes of functional flow can be thought of as biological, physical, and water quality attributes. This type of discussion could be placed ahead of Table 1.1 in which Physical, Biological, and Biogeochemical “Types of Ecosystem Functions” are related to specific functional flows.	Addressed in editorial changes	
Clarity of terms/definitions	The California Natural Flows Database -1: The sub link “Science” describes a set of “250 reference stream gages with little or no flow alteration across the state”. This contrast greatly with the 76 such locations described in the supporting literature for Appendix B and differing numbers of ‘reference sites or gauges in other portions of the Guidance and support materials. This differing number of reference gauges or sites should be addressed somewhere in the overall guidance.	Addressed in editorial changes	
Clarity of document	The Functional Flow database/website GUI similarly notes that “Given the diversity of landscapes and stream conditions in California, the accuracy of metric estimates is expected to vary based on the physical setting of individual streams. Users should consider local circumstances when interpreting the data…” However, no such language appears in Step 2 “Obtain natural ranges for functional flow metrics” of the Framework (pp.21-24). We recommend including this admonition so that future Framework users understand the importance of considering local circumstances when determining functional flows.	Addressed in editorial changes	
Other	Characterizing “Peak Flows” as “Floods” is problematic. First, the flows may not actually be ‘out-of-bank’ floods in the literal sense, especially the 2-year event. Secondly, using the ‘flood’ terminology can be very pejorative compared to the ‘functional’ nomenclature of simply a “peak”.	Addressed in editorial changes	

Clarity of document	Some of the statistics and units given for the functional flow metric “Peak Flows” are confusing. Under the ‘frequency’ category there would be no unit for the “number of 5-year floods/year” but the entries are tagged with “days” for a unit.	Addressed in editorial changes	
Clarity of document	In this table, under “Peak Flows, there is a confusing result presented at the “5-year flood frequency” entry. By definition, a 5-year event [of any type] would not be expected to occur with an annual frequency of 1. After examining the computational steps outlined in Appendix C, this appears to be a descriptive error; it would appear this is presenting the frequency within a single year, if it is actually a water year that has this level of peak flow. If this interpretation is correct, this should be clarified with the label text or a footnote. [there are probably other places in the document in need of the same treatment, such as the previous Table 1.2]	Addressed in editorial changes	
Clarity of document	Within the first reference given in this appendix [a draft of which is available to the public], which appears to be a principal resource for the hydrograph classification, it is stated that there were 91 reference sites utilized in the classification: 75 unimpaired gauges, and 16 naturalized gauge sites. There is no map or listing of the two types of sites and the given reference for the naturalized flow date source leads to a dead web link.	Addressed in editorial changes	
Other	The second reference given in this appendix has an erroneous weblink; it leads to the same document as the first reference, namely “Revealing the diversity of natural hydrologic regimes in California …”	Addressed in editorial changes	
Clarity of document	How do the 91 referenced sites utilized here compare to the 250 of the California Natural Flows Database, or the 219 cited in Appendix D. Are those utilized here from a different selection criteria for what constitutes an “unimpaired” site?	Addressed in editorial changes	
Clarity of document	Within the first reference given in this appendix, there were 16 sites with naturalized (=”simulated”) daily time series. Since there are various techniques to simulate naturalized flows (watershed models, corrections to gauges, machine learning techniques), the techniques should be divulged in the Appendix.	Addressed in editorial changes	

Ease of use for application	This Appendix is a well-written contribution to the Guidance, describing in condensed form a very difficult-to-finesse process of breaking a hydrograph into component parts via a series of mathematical algorithms. However, there are some important concepts presented in the associated, more-elaborate reference by Patterson, et al. 2020, that should be acknowledged here in this public-facing Guidance. As that work presents, there are flow typologies and anomalies where the algorithms do not function as well as desired. There should be some general advice here, and in Section A, to the user to proceed cautiously and inspect the results vis-à-vis actual hydrographs (as was done in Patterson, et al. 2020).	Addressed in editorial changes	
Other	While the functional flow component algorithms are a major accomplishment at automating and standardizing a difficult process, this approach clearly rest on the choice of many embedded, pre-specified parameters. For example, the description of the identification of the Fall Pulse Flow rest on seven pre-specified values for: - sigma, smoothing @ 0.2 - achieve 2x magnitude of previous dry base; - or achieve 0.08 cms; - duration of rising limb<20 days; -max. peak flow >=30% above both adjacent 'valleys' (before & after); - exception: identify very high dry season base with arbitrary threshold (e.g. 0.7 cms) -exception, if was high, use 1.5x magnitude threshold for fall pulse. A global comment for this appendix and the multiple parameter choice issue is below.	Addressed in editorial changes	

Other	For the Fall Pulse Flow, the stated ecosystem function of this component is scouring of the substrate, which would be accomplished when water velocity reaches a certain threshold vis-a-vis the particle size distribution of the riverbed, the bedslope, and characteristics of the accumulated detritus. Thus, a minimal effective Fall Pulse Flow would be very site dependent and seemingly not easily characterized with streamflow magnitude alone. The concern would be that the primary function of this pulse would not be accomplished at the lower end of the spectrum unless this contextual issue is addressed. It is noted that 0.08 cubic meters per second (1 cfs) [4th line page C4] is considered a lower threshold of significance. But this single value is extremely low, and as noted previously would not appear to be very applicable to the whole state. Of course, all functional flow metrics can be improved by more site-specific considerations, but for this flow component in particular, there does arise the question of whether the low magnitude values of identified Fall Pulse Flow are in fact "functional" for this particular desired ecosystem result. If they are ineffective, and included in the 'population' of values for deriving the statistics (e.g. 50th percentile), the results would be skewed lower than what is actually needed in the stream. Some additional parametric method of either describing cross-sectional area (& velocity), or scaling the minimum threshold value, based on stream order could be devised.	Addressed in editorial changes	
Clarity of document	Since the work presented here is to predict "natural functional flow metrics" it would seem to be rooted fundamentally in the use of underlying natural flows, either measured or estimated (="naturalized"). In Figure 1 the sites used to derive the functional flows are described as 'reference gauges' but not clearly indicated as to how these were selected. Are these the same sites with available natural or naturalized (="simulated") daily flows as presented in other portions of the Guidance and supporting materials?	Addressed in editorial changes	
Clarity of document	Figure 1 and in the text states that there are 219 reference sites. Are these a subset of the 250 utilized in the California Natural Flows Database referenced in Section A of the Guidance?	Addressed in editorial changes	
Consistency of language	The framework includes a collaborative process in Section B but not in Section A: why?	Addressed in editorial changes	

Other	Regarding "quantifying trade-offs": All stakeholders may not value the trade-offs in the same way. Therefore, guidance is needed on what to do if that happens, that is, how do those leading the effort work for and effect compromises? Are there tools to assist stakeholders in making compromises? Compromise may be a topic that deserves an appendix and perhaps that section is best written by someone with broad experience with Environmental compromises and their limitations. That is, someone like me.	No change	These types of analyses are beyond the scope of the CEFF guidance document at this time.
Other	What if the resulting flow objectives don't adequately support all beneficial uses?	Addressed in FAQs	
Ease of use for application	We suggest including a sample Implementation Plan for the example that has been used throughout the document.	Addressed in FAQs	
Ease of use for application	We recommend adding a section with procedures for establishing a monitoring program that will serve to provide the best information possible on whether progress is being made toward meeting management goals and objectives. It is important to strongly advise questioning all monitoring being conducted in order to determine if information is being. This is important because so many resources are expended on monitoring that is not connected to management effectiveness.	Addressed in FAQs	
Ease of use for application	The monitoring section is excellent because it emphasizes the four essential elements of a good monitoring program. However, monitoring frequency should be addressed. We suggest examination of the monitoring program be recommended as a standard part of adaptive management process.	No change	
Ease of use for application	We suggest providing more guidance on who to include in various workgroups and why.	No change	This topic is beyond the scope of the CEFF guidance document at this time.
Ease of use for application	We suggest adding a bullet to the Outcomes for Step 12: "Schedule for assessing progress and considering the need for change.	Addressed in editorial changes	
Ease of use for application	We recommend adding a recommendation that there be a schedule for evaluating progress toward meeting management goals/objectives.	Addressed in editorial changes	
Ease of use for application	We recommend adding a table of appendices at the end of the main guidance document and including in that table a column listing which part of the process and section of the guidance that appendix will be most useful.	No change	

Ease of use for application	We suggest adding a table of appendices at the end of the main document which includes notation of the step or steps in the process where each appendix will be useful.	No change	
Ease of use for application	P. 35 states "When the user determines in Section A that the natural ranges of flow metrics can be used to develop ecological flow criteria for all five functional flow components, the user skips Section B and proceeds to Section C." however, only Section B Step 7 (p. 45-46) addresses dry season baseflow variability. Variability does not seem to be addressed in sections A or C, so if Section B is skipped, important criteria could be missed. For example, hydropeaking (at hourly, daily, and weekly time scales) could cause negative effects if natural baseflows would tend to be steady. Variability should be addressed in section A or C so that it isn't missed.	Addressed in editorial changes	
Other	Step 9, assess flow alteration, on P. 54, defines conditions as "likely unaltered" where the median and majority of observations fall between the 10th to 90th percentile. This approach could ignore almost half of the observations (if they fall outside those bounds), and Figure 4.3 shows this apparently somewhat extreme alteration (shifting an occurrence that occurs naturally 50% of the time to only 10% of the time) to be a very liberal interpretation of "unaltered". What is the source of/basis for these guidelines?	No change	Appendix J provides details on the alteration assessment method

Clarity of document	The peak flow alteration assessment in Appendix J appears to be flawed. It acknowledges that the wet season peak flow metric is the 2, 5, and 10-year floods—metrics that are single values instead of a distribution. Yet these 50%, 20%, and 10% exceedance values do not translate well to the rules described in Appendix J, which apparently require a distribution of predicted reference values: "If current value falls within the 10th-90th percentile interval of predicted reference-based FFM values, then FFM is considered 'likely unaltered'." To compare the current 2, 5, and 10-year floods (50%, 20%, and 10% percentiles, respectively) to the range from 10% (10-year flood) to 90% (1.1-year flood) would be flawed, since the range is not narrow enough to be sensitive to alteration. Yet the way it is worded, this appears to be the recommendation in Appendix J. For example, Lee Vining Creek's 225 cfs (2-yr), 375 cfs (5-yr), and 475 cfs (10-yr) values would be compared to a range of 200-600 cfs, and all would be deemed unaltered! On the other hand, the approach in McBain & Trush 2010 (an analysis regarded by many as the state-of-the-art in environmental flow recommendations), acknowledged peak flow alteration and resulted in an increased flow recommendation of 300 cfs, 440 cfs, and 540 cfs, respectively (Figure 4-6 on p. 81 and Table 4-2 on p. 82).	Addressed in editorial changes	
Ease of use for application	P. 63 under Monitoring, criteria for performance measures are listed (with reference to Step 8). Ecological performance measures are first mentioned in Step 5 and used in steps 6 and 8—these criteria may be better placed earlier in the document (i.e. where first mentioned in step 5).	No change	

Clarity of document	Under the "Science" tab on the California Natural Flows Database website, the description of Predicted Functional Flows is confusing. The first sentence states that it used a similar modeling approach to the Predicted Monthly Flows method described above. However, a key difference is that the "estimated" value in the Predicted Monthly Flows method was the average of all years in the simulation period of 1950-2015. As described in App D of the CEFF guidance, the Predicted Functional Flows method used the median of all years in the simulation period of 1950-2015 "estimated" value in the Predicted Monthly Flows method; however, this is not mentioned on the website page. I suggest that this and any other key differences be clarified on the website. Also, the website refers to Appendix E of the CEFF guidance document, and I believe it should refer to App D.	Addressed in editorial changes	Editorial changes were made under the "Science" tab on the California Natural Flows Webapp.
Clarity of document	Please include page numbers to assist in identifying comments/changes to future drafts.	Addressed in editorial changes	
Clarity of document	The end of the first paragraph states that the work by Patterson, et al. (2020) is attached at the end of the document but it is not in the version posted at the time of this review.	Addressed in editorial changes	
Consistency of language	Under the heading “Data Smoothing and Splines” the text describing Figure 1 uses an unknown symbol for the Greek letter sigma, while the figure uses the standard symbol.	Addressed in editorial changes	
Clarity of document	Under “Timing” for the Fall Pulse Flow, the text says this pulse flow captures the date of the first storm, whereas it is actually examining runoff, which may or may not coincide with a first storm. The second sentence is more to the point and further qualifies it as a ‘significant increase’ in flows.	Addressed in editorial changes	
Clarity of document	Please include page numbers to assist with tracking comments/changes in future drafts.	Addressed in editorial changes	
Clarity of document	The list of “existing laws, policies and processes related to environmental flows that should be considered” should include existing State Water Policy as set forth in Water Code section 106 “that the use of water for domestic purposes is the highest use of water and that the next highest use is for irrigation.”	No change	CEFF is intended to address multiple regulatory requirments beyond Section 106

Clarity of document	Recommend removing references to “mitigation” in Steps 9, 10, 11 and 12, as “mitigation” has a particularized meaning under the California Environmental Quality Act, but agencies might use the Framework in differing circumstances, and with various legal baselines for analysis, where deviations in the environmental flow recommendation from the ecological flow criteria are not deemed adverse impacts for which “mitigation” must legally be provided. An example proposed edit - the second bullet under “Outcome of Step 11”[page 60] might be re-phrased, “List of measures to enhance the effectiveness of environmental flows or that avoid or offset adverse effects.”	No change	