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California Environmental Flows Framework: The Ways Good Science Gets Watered Down

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ABSTRACT

In the field of natural resources policy, there is a longstanding tendency for good science to get compromised and diluted when it comes to final agency actions and policies. In the water policy arena, this tendency has been particularly prevalent when it comes to agency-mandated instream flow standards, which often depart from agency determinations of what instream flow is needed to maintain healthy fisheries and ecosystems. In late 2021, the California Water Quality Monitoring Council approved the California Environmental Flows Framework ("CEFF"). The CEFF makes a distinction between "ecological flow criteria" and "environmental flow recommendations" and anticipates that CEFF "environmental flow recommendations" may depart from CEFF "ecological flow criteria" to accommodate consumptive uses of water. This article evaluates the extent to which the CEFF methodology may both support and hinder efforts to ensure there is instream flow to support healthy fisheries and ecosystems.

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INTRODUCTION: GROUNDING WATER POLICY IN SCIENCE

In the water law and policy arena, the relationship between science and politics has long been complex. This complex relationship has been particularly apparent in terms of setting instream flow standards.

Good science often reveals the instream flow levels that fisheries and ecosystems need to remain healthy, but such science-based instream flow levels may require reductions in water diversions and water storage (behind dams) that will acutely impact certain water users.[1] These water users then often deploy whatever political leverage or legal strategies available to reduce the science-based instream flow levels down to levels that are more acceptable to them.[2]

This watering-down has played out in California many times before under a variety of regulatory regimes, including California public trust law, the federal Endangered Species Act ("Endangered Species Act"), the federal Clean Water Act ("Clean Water Act") and California's Porter-Cologne Water Quality Act ("Porter-Cologne Act").[3]

In part due to dissatisfaction with this watering-down process, the California Environmental Flows Framework ("CEFF") was initiated in 2018 by the California Environmental Flow Working Group (a committee of the California Water Quality Monitoring Council) with funding from the California State Water Resources Control Board ("State Water Board").[4] In December 2021 the final version of the CEFF's technical report (referred to herein simply as the CEFF) was released.[5] This article assesses the extent which the CEFF may serve as an effective antidote to the watering-down scenario that has to date often characterized instream flow standard-setting

1. *See* PAUL STANTON KIBEL, RIVERFLOW: THE RIGHT TO KEEP WATER INSTREAM 275–77 (2021).

2. *See id.*

3. *See* Clean Water Act, 33 U.S.C. §§ 1251–1387; Endangered Species Act, 16 U.S.C. §§ 1531–1544; Porter-Cologne Water Quality Control Act, CAL. WATER CODE §§ 13000–16104 (2022); Cynthia L. Koehler, *Water Rights and the Pub. Tr. Doctrine: Resol. of the Mono Lake Controversy*, 22 ECOLOGY L.Q. 541 (1995).

4. CAL. WATER QUALITY MONITORING COUNCIL, CAL. ENV'T FLOWS FRAMEWORK 1–2 (2021) ("In 2017, a collaborative team of agency personnel, academic researchers, and non-governmental organization scientists from across the state formed an Environmental Flows Workgroup and began working on a common framework for determining ecosystem water needs that can be used to inform the development of environmental flow recommendations statewide. The goal of the workgroup was to develop a common, scientifically defensible approach that would enable managers from different agencies to incorporate their existing flow management tools and strategies, and that would be flexible enough to be used statewide. In 2018, the California Water Quality Monitoring Council recognized the workgroup as an official Council subgroup, which will help to ensure the framework is optimally positioned for adoption and use by the California agencies and other stakeholders. The California Environmental Flows Framework—as described in this report—should be viewed as a "living document" that will be updated periodically.").

5. *See id.*

for California waterways, as well as the extent to which water-use stakeholders may attempt to rely on the CEFF as a basis to perpetuate this watering-down scenario.

Following this introduction, Part I recounts how this watering-down process has played out in previous regulatory efforts under the federal Endangered Species Act, the Federal Power Act, the federal Clean Water Act and California's Porter-Cologne Act. Part II then analyzes the separate provisions of the CEFF related to "ecological flow criteria" and "environmental flow recommendations." In Part III, we consider how the CEFF might be used in the context of California's water quality certification of dams licensed by the Federal Energy Regulatory Commission ("FERC") pursuant to the Federal Power Act and the Clean Water Act. The conclusion in Part IV offers guidance on ways to utilize the science-based components of the CEFF while noting the potential for the "environmental flow recommendations" component of the CEFF to be misused.

I. WATERED-DOWN INSTREAM FLOW STANDARDS: PRIOR EXPERIENCE IN CALIFORNIA

To provide historical context for the recent CEFF effort concerning instream flows, below are accounts of two other situations in California that involved the interplay between science and politics, and between ecological criteria and non-ecological criteria, in terms of instream flow standard-setting.

A. THE ENDANGERED SPECIES ACT AND BAY DELTA FLOWS FOR ENDANGERED FISHERIES

In 2009, a lawsuit was filed by water contractors with the federal Central Valley Project ("CVP"), a California water project operated by the United States Bureau of Reclamation ("Reclamation Bureau").[6] The lawsuit, filed in federal district court for the Central District of California, challenged the 2008 biological opinion prepared by the United States Fish and Wildlife Service ("FWS") for CVP operations.[7]

6. *See* San Luis & Delta-Mendota Water Auth. v. Jewell, 747 F. 2d 581 (9th Cir. 2014).

7. *See id.*

The 2008 FWS biological opinion focused on impacts of CVP operations on the delta smelt, a fish species listed under the Endangered Species Act.[8] The delta smelt's habitat is the delta where the seawater from the Pacific Ocean mixes with freshwater from the Sacramento River and San Joaquin River (the "Bay Delta").[9] Delta smelt can live in brackish waters but cannot tolerate high salinity levels so the FWS biological opinion set forth freshwater instream flow requirements deemed necessary to prevent seawater intrusion.[10] The focus of these instream flow requirements was on maintaining the position of "X2" in the Bay Delta (the salinity level which delta smelt can tolerate).[11]

In 2010, Judge Oliver Wanger (of the federal district court for the Central District of California) issued a decision which found that the FWS biological opinion had failed to comply with the Endangered Species Act regulations regarding "economic feasibility" by improperly omitting analysis of the adverse economic impacts of the proposed instream flow levels on the plaintiffs specifically and water users in California more generally.[12] Judge Wanger found:

> The RPA [Reasonable and Prudent Alternatives in the delta smelt biological opinion] manifestly interdict the water supply for domestic human consumption and agricultural use for over twenty million people who depend on the Projects [the CVP and California's State Water Project] for their water supply…FWS has shown no inclination to fully and honestly address water supply needs beyond the species.[13]

Pursuant to Judge Wanger's interpretation of the "economic feasibility" regulations of the Endangered Species Act, the instream flow levels set forth in the FWS delta smelt biological opinion should have involved balancing the instream flow needs of the endangered delta smelt with the consumptive demands of water users.[14] Judge Wanger's 2010 opinion also ordered that the position of "X2" be moved several miles upstream (which would allow increased salinity levels in the Bay Delta and thereby reduce the need to curtail CVP diversions and impoundment of

8. *See* U.S. FISH & WILDLIFE SERV., BIOLOGICAL OPINION: FORMAL ENDANGERED SPECIES ACT CONSULTATION ON THE PROPOSED COORDINATED OPERATIONS OF THE CENTRAL VALLEY PROJECT (CVP) & STATE WATER PROJECT (SWP) (2008).

9. *See id.* at 152–53.

10. *See id.* at 192–202.

11. *See id.* at 222–37.

12. *See* Memorandum Opinion, San Luis & Delta-Mendota Water Auth. v. Salazar, 760 F. Supp. 2d 855 (E.D. Cal. 2010).

13. *Id.* at 957.

14. *See id.* at 957–58.

freshwater in the Sacramento River and San Joaquin River basins).[15]

In her December 18, 2010 article, titled Thoughts on the Latest Delta Smelt Ruling, Water Law Professor Holly Doremus (of the University of California, Berkeley School of Law) observed:

> [T]he opinion is clearly a win for the water users. Despite recognizing that the restrictions in the biological opinion are generally supported by the available scientific information, Judge Wanger repeatedly demands more detailed explanations of the specific regulatory limits imposed – for the specific flows required, the specific location of the X2[16]
>
> . . .
>
> What [Judge Wanger] wants . . . is an explanation of why FWS did not adopt a set of RPAs [Reasonable and Prudent Alternatives] that would have lesser consequences for water supply. Ultimately, I believe he wants FWS to find that perfect balance point at which the smelt (and salmon) can be saved from extinction at minimal cost to water users.[17]
>
> . . .
>
> If resource management agencies were required always to allow exploitation up to the very edge of resource collapse, collapse would be the rule because errors in estimating that point are common and systematically pushed by political pressures toward the side of over-exploitation.[18]

Judge Wanger's 2010 opinion was later reversed by the Ninth Circuit Court of Appeals in 2014.[19] In its reversal, the Ninth Circuit held that the "economic feasibility" analysis required in ESA regulations applied to the costs of implementing the actual RPAs rather than the economic impact on third parties (e.g. water users) of such implementation.[20] The Ninth Circuit also upheld and restored the original location of X2 proposed by the FWS biological opinion rather than the alternative X2 proposed by Judge Wanger.[21]

15. *See id*.
16. Holly Doremus, *Thoughts on the Latest Delta Smelt Ruling*, LEGAL PLANET (Dec. 18, 2010), https://perma.cc/DXZ5-MY5A.
17. *Id.*
18. *Id.*
19. *See generally* San Luis & Delta-Mendota Water Auth., *supra* note 6.
20. *See id.* at 645–55.
21. *See id.* at 616–24.

Despite this reversal by the Ninth Circuit, Judge Wanger's 2010 opinion stands as an example of the ways that the economic interests of and political pressure by water users can result in efforts to weaken science-based instream flow levels deemed necessary to maintain healthy fisheries and ecosystems.

B. BASE FLOWS FOR THE SAN JOAQUIN RIVER'S MAIN TRIBUTARIES PURSUANT TO THE CLEAN WATER ACT AND CALIFORNIA'S PORTER COLOGNE ACT

Along with the Sacramento River, the San Joaquin River is the other main river that flows into the Carquinez Strait and then to San Francisco Bay.[22] The three largest tributaries to the San Joaquin River are the Mokelumne River, the Stanislaus River and the Tuolumne River.[23]

Due to concerns about declining and endangered fisheries (e.g. salmon, steelhead trout, delta smelt) in the Bay Delta and the greater Sacramento River-San Joaquin River watershed, in 2009 the Delta Reform Act was enacted in California.[24] Section 85086 of the Delta Reform Act provides that the Water Board:

> [S]hall, pursuant to its public trust obligations, develop new flow criteria for the Delta ecosystem necessary to protect public trust resources. In carrying out this section, the board shall review existing water quality objectives and use the best available scientific information. The flow criteria for the Delta ecosystem shall include the volume, quality, and timing of water necessary for the Delta ecosystem under different conditions. The flow criteria shall be developed in a public process by the board within nine months of the enactment of this division. The public process shall be in the form of an informational proceeding.[25]

Pursuant to Section 85086, in August 2010, the State Water Board adopted final public trust flow criteria for the Bay Delta ecosystem.[26] Among other things, the public trust flow criteria provided for 60 percent of the unimpaired San Joaquin River inflow into the Bay Delta from February through June and 75% of unimpaired Delta outflow from January

22. *See* Paul Stanton Kibel, *Truly a Watershed Event: California's Water Board Proposes Base Flows for the San Joaquin River Tributarie*s, CAL. WATER L.J. (Oct. 11, 2016, 9:56 AM), https://perma.cc/L5H4-DJ74.

23. *See id.*

24. *See* Delta Reform Act, CAL. WATER CODE §§ 85000–85350 (2022).

25. *Id.* § 85086.

26. *See* CAL. STATE WATER RES. CONTROL BD., DEV. OF FLOW CRITERIA FOR THE SACRAMENTO-SAN JOAQUIN DELTA ECOSYSTEM (Cal. Env't Prot. Agency 2010).

to June.[27] The State Water Board's 2010 public trust flow criteria did not specifically address the contribution of the flows of the Mokelumne River, Stanislaus River and Tuolumne River to the flows in the San Joaquin River.

Nearly a decade later, in December 2016, the State Water Board adopted base flows for the San Joaquin River tributaries pursuant to its update to the *Bay Delta Water Quality Control Plan* (under the Clean Water Act and California's Porter-Cologne Act).[28] In its *Summary of Proposed Updates to the Bay Delta Water Quality Control Plan*, the State Water Board explained the relationship between the 2010 public trust flow criteria and the flow standards set forth in the *Update to the Bay Delta Water Quality Control Plan*:

> As part of the 2009 Delta Reform Act, the [California] Legislature directed the State Water Board to develop flow criteria for the Delta ecosystem necessary to protect public trust uses. In keeping with the narrow focus of the legislation, the State Water Board's 2010 Delta Flow Criteria Report only presents a technical assessment of flow and operational requirements to provide fishery protection under existing conditions. The report does not do the analysis to inform the consideration of competing uses that is required by the California Water Code. The Delta Flow Criteria Report determined that 60 percent of the unimpaired San Joaquin River inflow from February-June was necessary to preserve the attributes of a natural, variable system to which native species are adapted.[29]

The 2018 Update to the Bay Delta Water Quality Control Plan provides for a 30 to 50 percent flow "range" for the Mokelumne River, Stanislaus River and Tuolumne River with a "starting point" of 40% on unimpaired flow.[30] The "range" of flows (30% to 50% of unimpaired flow) and the "starting point" for flows (40% of unimpaired flows) for the San Joaquin River tributaries in the Update to the Bay Delta Water Quality Control Plan are considerably below the flow standard (60% of unimpaired flow) for the San Joaquin River in the 2010 Delta Flow Criteria Report.[31] The flow range and starting point flows for the San Joaquin River tributaries presented by the State Water Board were criticized by many environmental and fishery conservation groups as being too low to restore and sustain salmon,

27. *Id.* at 154–55.

28. *See* Kibel, *supra* note 22.

29. CAL. STATE WATER RES. CONTROL BD., SUMMARY OF PROPOSED UPDATES TO THE BAY-DELTA WATER QUALITY CONTROL PLAN 2–3 (Sept. 15, 2016).

30. *See id.* at 4.

31. *See id.*

steelhead trout and delta smelt fisheries.[32]

In noting the ways that the science-based instream flow levels presented in the 2010 *Delta Flow Criteria Report* (which were informational in nature) were watered-down by the State Water Board when translated into the instream flow standards adopted in the 2018 *Update to the Bay Delta Water Quality Control Plan*, this is not to suggest that there was or is necessarily anything illegal about this process. Under California public trust law, once a trustee agency (such as the State Water Board) determines what measures are needed to fully protect public trust uses, it is then permitted to adjust these measures based on what is deemed "feasible."[33] So public trust law, as it is currently formulated in California, permits the type of political non-scientific compromises to science-based instream flow levels that took place in setting the instream flow standards in the *2019 Update to the Bay Delta Water Quality Control Plan*.[34]

Regardless of the legality involved, an examination of the relationship between the 2010 *Delta Flow Criteria Report* and the 2018 *Update to the Bay Delta Water Quality Control Plan* reveals the ways that the instream needs of ecosystems and fisheries can be systematically diluted to accommodate the economic and political interests of water-users. This example also serves as a template for understanding the structure of and assumptions underlying the CEFF.

II. THE CEFF: PART SCIENCE AND PART POLITICS

As noted in this article's introduction, in December 2021 the California Environmental Flow Working Group of the California Water Quality Monitoring Council released the final version of the CEFF technical guidance document.[35] The opening background section of the CEFF explains the context that led to the development of the framework:

32. *See, e.g.,* Press Release, Doug Obegi, Nat'l Res. Def. Council, State Water Board's Flow Proposal Falls Short (Sept. 15, 2016), https://perma.cc/HGJ8-CRF9.

33. Nat'l Audubon Soc'y v. Superior Ct., 33 Cal.3d 419, 446 (1983).

34. *See id.*

35. *See generally* CAL. WATER QUALITY MONITORING COUNCIL, *supra* note 4.

> Environmental flow assessments have not always been consistently designed and implemented in a way that allows data to be aggregated and shared making it difficult to accelerate learning and improve the effectiveness of environmental flows in supporting the ecological health of California rivers and streams. Water managers need a consistent statewide approach that can help transform complex environmental data into scientifically defensive easy-to-understand environmental flow recommendations that support a broad range of ecosystem functions and preserve the multitude of benefits provides by health rivers and streams.[36]

The background section of the CEFF then explains the framework's approach to the relationship between the ecosystem needs of rivers and streams and competing demand for water by water-users:

> In most rivers, ecosystem water needs must be balanced with legal and regulatory requirements, public health and safety requirements, and social values and priorities for water, including other human uses. It is essential both to recognize these sociopolitical dimensions in the process of developing environmental flow recommendations, and also to clearly distinguish sociopolitical considerations from the underlying scientific process of assessing ecosystem water needs.[37]

The opening section of the CEFF therefore acknowledges and discloses that the framework is part science and part politics but highlights that these two components should be sharply distinguished.[38] This is further explained in the section of the CEFF titled "Framework overview and purpose":

36. *Id.* at 1.
37. *Id.* at 1–2.
38. *Id*. at 1.

> The first two Sections of the Framework support development of consistent scientifically-supported ***ecological flow criteria*** – i.e. quantifiable metrics that describe ranges of flow that must be maintained within a stream and its margins to support the natural functions of healthy ecosystems. Upon this scientific foundation, users are then able to develop ***environmental flow recommendation***s that take human uses and other water management objectives into consideration. (bold and italics in original, underline added.)[39]

The use of the word "must" in the above-quoted paragraph is noteworthy, as it suggests that setting instream flow standards at levels below those presented in the ecological flow criteria may not be sufficient to "support the natural functions of healthy ecosystems."[40] At the outset the CEFF thus concedes that while such instream flow standards may be an ecological improvement over the status quo they may fall short of meeting ecosystem needs.

The CEFF presents 12 steps leading to the development of environmental flow recommendations.[41] Steps 1 to 4 are set forth in Section A, steps 5 to 7 are set forth in Section B and steps 8 to 12 are set forth in Section C.[42] In many ways, the structure of the CEFF parallels the ways (as described above) instream flow levels were transformed as they moved from science-based and ecosystem-based process reflected in the 2010 Delta Flow Criteria to the economics-based and politically-based process reflected in the 2018 Update to the Bay Delta Water Quality Control Plan.[43] That is, similar to the two-step public trust law methodology in California, steps 1 to 7 of the CEFF reflect what ecosystems and fisheries need while steps 8 to 12 of the CEFF call for compromising what ecosystems and fisheries need in the name of economic and political feasibility.[44]

39. *Id.* at 2.
40. *See id.*
41. *Id.* at iv–vi.
42. *Id.*
43. CAL. STATE WATER RES. CONTROL BD., RESOL. 2018-0059 (adopted Dec. 12, 2018).
44. CAL. WATER QUALITY MONITORING COUNCIL, *supra* note 4 at iv–vi.

A. PART SCIENCE – ECOLOGICAL FLOW CRITERIA

A comprehensive review of the CEFF's scientific methodology for establishing ecological flow criteria is beyond the scope of this article (which is focused on the legal aspects and implications of the CEFF). However, an overview of some key components of this scientific methodology is required to understand the differences and relationship between ecological flow criteria and environmental flow recommendations.

The foundation for the CEFF's approach to ecological flow criteria is the concept of "functional flows." As described in the CEFF, "Functional flows are those aspects of the flow regime that support stream processes and collectively maintain stream ecosystem health."[45] The CEFF identifies five functional flow components: (1) fall pulse flows; (2) wet-season peak flows; (3) wet-season base flow; (4) spring recession flow; and (5) dry-season base flow.[46] The CEFF provides that the ecological flow criteria for watercourses should include each of these five functional flow components.[47]

Step 1 of the CEFF (titled "Define ecological management goals") explains: "Ecological management goals for the study area should be specified. These goals express the specific objectives that ecological flow criteria are intended to achieve. For example, goals may include supporting the habitat and life history requirements of native fish species."[48] In Step 1, the user of the CEFF "identifies the specific ecosystem functions that must be supported by ecological flow criteria to achieve ecological management goals."[49]

Step 3, titled "Evaluate whether the natural ranges of function flow metrics will support functions needed to achieve ecological management goals," involves analysis of the functional flow metric for what is often called "unimpaired flow" (natural flows that would exist but for man-made interventions such as dams and out-of-stream diversions).[50] As explained in the CEFF section on Step 3, "Maintaining functional flows within their natural range is hypothesized to support ecosystem functions to sustain healthy ecosystem conditions for native freshwater species under natural watershed conditions."[51]

45. *See id.* at 11–13.
46. *See id.*
47. *See id.*
48. *See id.* at 17.
49. *See id.* at 17.
50. *Id.* at 23–24.
51. *Id.* at 23.

Based on the information regarding natural ranges/unimpaired flow provided in Step 3, Step 4 of the CEFF (titled "Select ecological flow criteria") states: "Ecological flow criteria are selected for all functional flow components for which the natural range of metrics is expected to support ecosystem functions."[52] Step 4 does not require the automatic adoption of natural ranges/unimpaired flows as ecological flow criteria but suggests that the levels of ecosystem support provided by such natural ranges should serve as a key reference point for the establishing ecological flow criteria.[53]

Step 5 of the CEFF is titled "Develop detailed conceptual model relating focal flow components to ecological management goals."[54] As the CEFF explains: "In this step the user creates a conceptual model that represents all linkage between a focal flow component and ecological management goals."[55] Step 5 continues:

> The conceptual model should specify the relationships between flow metrics and ecological management goals, which are expressed as ***ecological performance measures***. Flow metrics are quantitative measures of a specific characteristic of a flow component, e.g. the magnitude of the dry season baseflow component (measured in cubic feet per second) or start timing the spring recession flow (measured as the water year date of occurrence). Ecological performance measures are 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. (bold and italics in original.)[56]

A summary of the sequential scientific methodology in Sections A and B of the CEFF is therefore as follows: define ecological management goals; determine natural ranges/unimpaired flows in terms of the five functional flow components; select ecological flow criteria for the five functional flow components; develop conceptual model of ecological flow criteria; develop environmental performance measures to quantitatively monitor the extent to which ecological flow criteria are achieving the designated ecological management goals.

52. *Id.* at 26.
53. *See id.* at 26–29.
54. *Id.* at 33.
55. *Id.*
56. *Id.* at 34.

B. PART POLITICS – ENVIRONMENTAL FLOW RECOMMENDATIONS

Section C of the CEFF is titled "Development of environmental flow recommendations" and begins:

> Section C outlines a process for developing environmental flow recommendations that balance ecological management goals with other non-ecological/human use water management goals (non-ecological management goals). This section represents a transition from a scientific process in which ecological flow criteria are developed (Sections A and B) to a process that incorporates social values, and other management needs, including human uses of water. . . Section C is intended to offer a conceptual framework, including suggested tools, to help the user appropriately balance ecological management goals with other non-ecological management goals to develop a set of environmental flow recommendations.[57]

For Step 8 (titled "Identify management objectives"), the CEFF states: "The ecological flow criteria developed in Sections A and B support the ecological management goals for a study area.[58] Development of environmental flow recommendations, however, also requires consideration of **non-ecological management goals**, which may include meeting municipal and agricultural water demands. . ." (bold added.)[59]

57. *Id.* at 45.
58. *Id.* at 48.
59. *Id.*

Step 8 also provides "In California, existing law, policies and processes related to environmental flow that should be considered include…State water rights law, which may affect environmental flows recommendation due to competing or senior water rights."[60] The CEFF does not explain how such "competing or senior water rights" should factor into the development of environmental flow recommendations but presumably this relates to efforts to avoid instream flow standards that would acutely impact less senior/more junior holders of appropriative water rights (who might face severe curtailments as compared to more senior appropriative water rights holders).[61] Step 8 urges agencies involved in instream flow standard-setting to identify the agencies and stakeholders associated with non-ecological management goals (e.g. water use) and provides that such "agencies and stakeholders should be involved in the objective-setting process."[62]

Step 10 of the CEFF (titled "Evaluate management scenarios and assess trade-offs") begins by noting:

> Ecological flow criteria represent one possible environmental flow recommendation that achieves ecological management goals but that potentially disregards other management needs. Environmental flow recommendations that deviate from ecological flow criteria may satisfy other management needs but risk the failure in achieving ecological management goals…there is likely to be a discrete set of scenarios that are potentially **acceptable** to stakeholders and require detailed evaluation (bold added.)[63]

This passage seems to suggest that the CEFF proposes that detailed evaluation of alternatives (for environmental flow recommendations) be focused to those alternatives that will be "acceptable" to stakeholders such as water-users.

60. *Id.* at 47.

61. Gary Swayers, *A Primer on California Water Rights* 6 (2007) ("Among appropriators, the priority of each appropriator's right is determined by the relative timing of the commencement of use, i.e., first in time is first in right.").

62. CAL. WATER QUALITY MONITORING COUNCIL, *supra* note 4 at 48.

63. *Id*. at 54.

Step 10 suggests that agencies involved in instream flow standard setting should adhere to the following sequencing when developing environmental flow recommendations. First, identify non-flow management actions that have the potential to satisfy ecological management objectives while reducing adverse impacts on water users.[64] Second, identify flow-based management alternatives to minimize impacts on water users that also minimize deviance from the ecological flow criteria.[65] Third, once alternative non-flow and flow scenarios have been identified, agencies involved in instream flow standard-setting should assess the trade-offs among management objectives for each alternative.[66]

Step 10 provides little guidance as to how such tradeoff assessment (between ecological management objectives and non-ecological management objectives) should be conducted. However, if (as discussed above) the CEFF's assumption is that the environmental flow recommendations should be acceptable to agencies and stakeholders whose primary concern is water use, then this assumption would necessarily affect the tradeoff assessment.[67] That is, based on this assumption, the CEFF-recommended tradeoff assessment should give considerable weight to the non-ecological interests of water users which are often economic in nature.

Step 11 of the CEFF states: "In Step 11 the user defines environmental flow recommendations that account for both human and ecological needs and objectives. For some functional flow metrics, the environmental flow recommendations and the ecological flow criteria will be the same, but they may differ in cases where management tradeoffs cannot be avoided."[68] The CEFF does not provide further explanation of what is meant by "tradeoffs that cannot be avoided."

However, if (as discussed above) the CEFF's assumption is that the environmental flow recommendations should be acceptable to agencies and stakeholders whose primary concern is water use, then it would follow that "tradeoffs that cannot be avoided" refers to situations where the ecological flow criteria are not acceptable to water users (e.g. agencies/stakeholders that use water for agricultural irrigation, municipal water supply or hydropower generation).[69]

64. *Id.*
65. *Id.* at 55.
66. *Id.*
67. *See id.* at 57–59.
68. *Id.* at 58.
69. *See id*. at 57–58.

C. COMMENTS ON CEFF DRAFT GUIDANCE DOCUMENT

In 2020, a draft version of the CEFF guidance document was circulated for comment to all of the participants in the CEFF process.[70] As detailed below, some of the comments on the 2020 Draft CEFF guidance document addressed the relationship between the development of ecological flow criteria and the development of environmental flow recommendations.

The December 18, 2020, comment letter from MBK Engineers (based in Sacramento, California) stated:

> The rivers in the Sacramento Valley are managed for multiple benefits through the operation of dams, levees, weirs and canals. The operations of the major rivers in the Sacramento Valley are significantly constrained by multiple competing needs and management objectives. It is our experience that that these existing operational constraints significantly limit the range of potential flow recommendations in managed ecosystems like the Sacramento Valley and other Delta watersheds.[71]
>
> ...
>
> The [CEFF] Framework describes the first two sections as science-based and the final section, Section C, as sociopolitical considerations. Our experience tells us that Section C will be the most challenging part of the Framework to implement. Step 10 of the Framework, evaluate management scenarios and assess tradeoffs, is the critical step.[72]

The San Joaquin Tributaries Authority ("SJTA") represents parties that divert and use water from the main tributaries to the San Joaquin River (which includes the Mokelumne River, the Stanislaus River and the Tuolumne River).[73] In its December 18, 2020 comment letter, the SJTA opined:

70. Draft Version of Guidance Document for the California Environmental Flows Framework (California Environmental Flow Working Group of California Water Quality Monitoring Council, released Oct. 2020).

71. MBK Engineers, Comment Letter on the California Environmental Flows Framework (Dec. 18, 2020), at 2 (on file with author).

72. *Id.*

73. *See* San Joaquin Tributaries Authority, Comment Letter on the California Environmental Flows Framework (Dec. 18, 2020), at 1 (on file with author).

> The [CEFF] Framework unlawfully elevates fish and wildlife needs above all other beneficial uses by focusing only on natural functional flows and purely ecological management objectives. Only in the final steps of the Framework does the process "reconcile" ecological flow criteria with non-ecological management objectives – i.e. consideration of non-fish and wildlife beneficial uses – to the latest possible stage unlawfully prioritizes fish and wildlife uses above other higher uses of water in the development of flow criteria.[74]
>
> . . .
>
> The development of a Framework for setting flows that does not consider the critical interests of water rights holders and water managers that operate the regulated systems is deficient and cannot be used beyond theoretical applications.[75]
>
> . . .
>
> Consistent with these comments, the SJTA requests the current approach articulated in the [CEFF] Framework be abandoned and that any future effort to consider a functional flows approach more adequately ensure that fish and wildlife uses are not unlawfully elevated above all other beneficial uses.[76]

The SJTA comment letter's allegation that the CEFF is "unlawful" and deficient because it fails to adequately reflect the interests of "water rights holders" bears particular attention.[77] Putting aside whether the SJTA's comment letter reflects an accurate understanding of the proposed CEFF process, the SJTA's allegations related to the unlawful disregard of water rights makes clear that SJTA may legally challenge any environmental flow recommendations that infringe upon the interests of existing water users, a position that (pursuant to the CEFF process) suggests that it is unlikely that consensus will be easily reached with the SJTA on environmental flow recommendations that reflect ecological flow criteria. This is relevant because (as discussed above) the CEFF process itself appears to suggest that such consensus should be sought with water-users in the final development of environmental flow recommendations.[78]

74. *Id.*
75. *Id.* at 2–3.
76. *Id.* at 3.
77. *Id.* at 1–3.
78. *See generally* CAL. WATER QUALITY MONITORING COUNCIL, *supra* note 4.

The approach and dynamic revealed in the SJTA comment letter therefore dovetails with the observation in the MBK Engineers' comment letter that Section C of the CEFF is the "critical" step.[79] It is the critical step because this is where strong economic and political interests have the potential to forcefully participate in the CEFF process in a way that is likely to result in the dilution of the ecological flow criteria.

III. CEFF IN THE CONTEXT OF CALIFORNIA WATER QUALITY CERTIFICATION UNDER THE FEDERAL POWER ACT AND THE CLEAN WATER ACT

The process for state water quality certification for federally licensed dams provides a tangible example of the ways that the CEFF might be employed going forward.

Under section 401 of the Clean Water Act, federal agencies are required to obtain and comply with a water quality certification issued by a state for federally-approved projects with impacts on instream water quality.[80] Under the Federal Power Act, the Federal Energy Regulatory Commission ("FERC") is responsible for issuing licenses for many non-federal dams and such FERC licenses usually include schedules and requirements for the release of water downstream of dams to maintain water quality for fisheries and ecosystems.[81]

In California, the operators of such non-federal FERC-licensed dams may include state agencies such as the California Department of Water Resources ("DWR") that manages Oroville Dam on the Feather River, local/regional public irrigation and water agencies (e.g. the Modesto Irrigation District and Turlock Irrigation District that manage Don Pedro Dam and La Grange Dam on the Tuolumne River or the San Francisco Public Utilities Commission that manages Hetch Hetchy Dam on the Tuolumne River) and private utility companies (such as Pacific Gas & Electric that manages a series of dams on the Feather River behind DWR's Oroville Dam).[82]

79. MBK Engineers, *supra* note 71.

80. *See* 33 U.S.C. §1341(a)(1).

81. *See* 16 U.S.C. §797(e).

82. HETCH HETCHY POWER SYS., SAN FRANCISCO PUB. UTILS. COMM'N, https://perma.cc/2JKT-U44L (last visited Sept. 28, 2022, 10:15 PM); FED. ENERGY REGUL. COMM'N (FERC) PROJECT NO. 14581, CAL. WATER BDS., (Dec. 3, 2021) https://perma.cc/3DJA-5464; FED. ENERGY REGUL. COMM'N (FERC) PROJECT NO. 2105, CAL. WATER BOARDS, (Mar. 5, 2021), https://perma.cc/W5JN-A5C7; FED. ENERGY REGUL. COMM'N (FERC) PROJECT NO. 2100, CAL. WATER BDS., (Mar. 3, 2020) https://perma.cc/KX89-5YCT.

When read together, section 401 of the Clean Water Act and the Federal Power Act provide that FERC licenses should reflect the state-imposed conditions of the water quality certification issued in connection with dam licenses approved by FERC.[83] As Kristin Peer (Deputy Secretary and Special Counsel for Water Policy at the California Environmental Protection Agency) and Stacy Gillespie (Senior Staff Counsel for the State Water Board) explained in their 2021 law review article *Safeguarding Water Quality in Federal Licensing Decisions: California's Response to Recent Constraints on Clean Water Act 401 Certification Authority*:

> If a state grants certification with conditions, those conditions become conditions of the federal permit or license. If the state denies certification, the federal agency cannot issue the permit or license.[84]
>
> . . .
>
> Although the Federal Power Act generally preempts states from administering state water quality control authority over FERC-licensed projects, the Clean Water Act authorizes states to certify that a proposed FERC-licensed project will comply with the Clean Water Act requirements and with any other pertinent requirement of state law.[85]

Moreover, in its 1994 decision in *PUD No. 1 v. Washington Department of Ecology*, the United States Supreme Court held that state water quality certifications can include provisions specifying the quantity and timing of downstream releases from dams to maintain instream flow for fisheries.[86] Pursuant to section 401 of the Clean Water Act, in California, the State Water Board is the designated state agency to issue water quality certifications.[87]

83. Kristin Peer and Stacy Gillespie, *Safeguarding Water Quality in Federal Licensing Decisions: California's Response to Recent Constraints on Clean Water Act Section 401 Certification Authority*, 13 GOLDEN GATE UNIV. ENV'T L.J. 1, 8–9 (2021) ("While the Federal Power act generally preempts state law over FERC-licensed, single-purpose hydroelectric projects, it does not preempt application of other federal laws. Pursuant to authority provided by other federal statutes, the states may regulate federally licensed FERC facilities in accordance with that authority…The Clean Water Act gives states, in section 401, authority to grant, grant with conditions, deny or waive water quality certifications before a federal license or permit is issued for activities that could result in a discharge to the water of the United States within their borders. If the state denies certification, the federal agency cannot issue the permit or license").

84. *Id.* at 9.

85. *Id.*

86. Pub. Util. Dist. No. 1 v. Wash. Dep't of Ecology, 511 U.S. 700, 700 (1994).

87. CAL. WATER CODE §13170 (2022).

There are many FERC-licensed dams in California located on streams and watersheds that support fisheries. For instance, as of the writing of this article, FERC was in the process of reviewing licensing applications for Don Pedro Dam and La Grange Dam on the Tuolumne River which (as discussed above) is tributary to the San Joaquin River that eventually flows into the Bay Delta and San Francisco Bay.[88] The Tuolumne River/San Joaquin River/Bay Delta basin serves as habitat for salmon, steelhead trout and delta smelt.[89] In connection with the FERC licensing process for Don Pedro Dam and La Grange Dam in early 2021 the State Water Board issued a water quality certification that provided conditions for the release of water downstream to maintain instream flows for fisheries.[90]

Looking ahead, how might the CEFF be relied upon and utilized for the conditions in water quality certifications that pertain to releases from upstream dams to maintain instream flow for downstream fisheries?

Pursuant to steps 1 to 7 of the CEFF, the State Water Board would begin with a scientific/technical assessment to develop ecological flow criteria for portions of the waterways downstream of the FERC-licensed dam.[91] The State Water Board could then use this ecological flow criteria to determine the amount and timing of releases of water from the upstream dam needed to meet such ecological flow criteria.[92]

88. *See* Water Quality Certifications Issued Under Section 401 of Clean Program Water Act, Project Nos. 2299 and 14581 (2021).

89. *Id.*

90. *Id.*

91. *See* CAL. WATER QUALITY MONITORING COUNCIL, *supra* note 4.

92. *Id.*

However, pursuant to steps 8-12 of the CEFF, before the ecological flow criteria were used as the basis for conditions in the water quality certification, the State Water Board would then engage in a balancing of this ecological flow criteria with the economic interests of the project applicant for the FERC license or those who receive water or hydropower-generated electricity from the project.[93] Consistent with steps 8-12 of the CEFF process, the State Water Board would then invite the applicant for the FERC-license and other stakeholders reliant on water and/or power from the project to participate in the process of drafting the final water quality certification conditions with a focus on coming up with environmental flow recommendations that are acceptable to the applicant and such stakeholders.[94] The State Water Board would then base the instream flow/downstream release provisions in the water quality certification not on the ecological flow criteria but on the environmental flow recommendations developed with the input of the applicant for the FERC license and other water use stakeholders.[95]

In the context of FERC licensing of dams in California, the State Water Board could therefore use the CEFF's ecological flow criteria/environmental flow recommendations sequencing and methodology as a basis for the conditions in the water quality certification relating to instream flow. In this setting, we can see how reliance on the CEFF would require the State Water Board to first identify the ecological flow criteria below the dam that is needed to maintain healthy fisheries and ecosystems without reference to competing consumptive non-ecological criteria.[96]

However, in this setting we can also see how the applicant for the FERC-license (and perhaps the State Water Board as well) could then attempt to rely on the CEFF to justify departing from such ecological flow criteria in the development of environmental flow recommendations that would then serve as the basis for water quality certification conditions related to instream flow levels.[97]

93. *Id.* at 47–62.
94. *Id.*
95. *Id.*
96. *Id.*
97. *Id.* at 47–62.

An advantage of using the CEFF in this context would be greater transparency in terms of how the State Water Board's instream flow conditions in water quality certifications (based on the environmental flow recommendations) depart from the ecological flow criteria.[98] A potential disadvantage of the CEFF in this context is that its methodology invites, and thus may be deployed to perpetuate, the tendency to water down instream flow standards to levels that are below what is needed to maintain healthy ecosystems and fisheries.[99]

IV. Conclusion: Informed by Science but Not Based on Science

When assessing the CEFF, it is useful to focus in on two key terms employed in the CEFF process. First, the end deliverable of the CEFF is the adoption of "environmental" flow recommendations, and the CEFF methodology is set forth in a report titled a "technical" guidance document.[100] This terminology suggests that the flow recommendations that emerge from the CEFF process will support natural ecosystems and protect the "environment" and that the CEFF methodology is grounded in "technical" considerations.

As detailed in this article, these suggestions are true to a certain extent, but in another sense, are not altogether accurate. That is, while it is true that steps 1 to 7 of the CEFF lay out a consistent transparent science-based methodology for determining ecological flow criteria to maintain healthy ecosystems and fisheries, it is also true that steps 8 to 12 of the CEFF provide for the development of environmental flow recommendations that are based on economic/political considerations rather than science and that may result in instream flow standards that fall short of maintaining healthy ecosystems and fisheries.[101]

Or put another way, there is not much that is "technical" about steps 8 to 12 of the CEFF and these steps may result in final flow recommendations that weaken rather than strengthen the "environmental" protection for ecosystems and fish as compared with ecological flow criteria. What CEFF steps 8 to 12 provide is a more structured and transparent process for this watering-down of science-based instream flow standards to occur.

98. *Id.* at 17–42.
99. *Id.* at 47–62.
100. *Id.*
101. *Id.* at 17–42 and 47–62.

It could certainly be argued that if this watering down of instream flow standards is likely to take place anyway, the CEFF represents an improvement over the status quo in that its methodology forces agencies and stakeholders to disclose how final instream flow recommendations depart from ecological flow criteria. This is a distinction, however, that many agencies and water use stakeholders may well seek to gloss over. Such agencies and water use stakeholders may seek to represent to the media and public that the final "environmental" flow recommendations produced using the CEFF are "technical" and "science-based" in nature and are primarily designed to protect and restore ecosystems and fisheries – which may not be the case. In reality, the CEFF's "environmental" flow recommendations could perhaps be more accurately described as "political" flow recommendations.

By its design, the CEFF accepts at the outset that final agency-approved instream flow levels may fall short of what good science supports and of what ecosystems and fisheries need.[102] There is perhaps something honest and practical in the CEFF's approach but there is also something troubling and disheartening in the CEFF's starting assumption that water policy based on sound science may not be economically or politically feasible.

An alternative starting assumption might be that we need to make appropriate adjustments, economically and politically, so that water policy is, in fact, based on good science, and that we need to work collectively on economic/political solutions and more equitable implementation so that the science-based ecological flow criteria developed by agencies and the final instream flow standards adopted and enforced by agencies are one and the same.

102. *Id.*