July 30, 2024

Ashley Couch
Water Resources Manager
San Joaquin County
1810 East Hazelton Ave
Stockton, CA 95201
acouch@sjgov.org
submitted via email

Re: Comments on July 2, 2024, Notice of Preparation of an Environmental Impact Report for the Mokelumne River Integrated Conjunctive Use Program.

Dear Mr. Couch:

California Sportfishing Protection Alliance (CSPA) and The Center for Biological Diversity (The Center) respectfully submit the following comments on scoping for the proposed Mokelumne River Integrated Conjunctive Use Program (MICUP or Project).

CSPA is a nonprofit, public interest environmental organization. CSPA has been an advocate for fish, habitat, and water quality for 40 years. A leader in efforts to improve fisheries and fishing opportunities. CSPA is also one of California's major water policy organizations, with decades of consistent and effective advocacy before the State Water Resources Control Board and regional water quality control boards.

The Center is a nonprofit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 1.7 million members and online activists throughout California and the United States. The Center has worked for many years to protect imperiled plants and wildlife, open space, air and water quality, and overall quality of life for people in the Mokelumne River watershed.

These comments are made in response to the description of the project provided in the July 2, 2024, Notice of Preparation (NOP) of an Environmental Impact Report (EIR) issued by San Joaquin County Public Works Department.

Introduction

The future of MICUP depends on Water Rights Application 29835 (Application 29835). Application 29835 was first filed in 1990 and amended in 2014. The amended application proposed to store appropriated water in underground storage rather than in Middle Bar Dam or Duck Creek Dam. The amended application also reduced the points of diversion to Pardee Dam and various points between Camanche Dam and the Intersection of Mokelumne River and Interstate 5.

Application 29835 seeks to appropriate up to 110,000 acre-feet (AF) of Mokelumne River water per year. This water would be diverted at a rate of up to 620 cubic feet per second (cfs) between December 1 and June 30 during Wet years. Most of this water would be stored in aquifers that are currently overdrafted. Up to 48,000 AF of this water would also possibly be stored in Camanche and/or Pardee Reservoir. San Joaquin County and others would then utilize this water for agricultural irrigation, municipal use, industrial use, and to recharge aquifers for later use.

The proposed water that would be used to recharge San Joaquin County's over-drafted aquifers is surface water derived from an already over-appropriated river. Water Right Order 98-08 declared the Mokelumne River to be fully appropriated from March through November of every water year. The State Water Resources Control Board (State Water Board) offered a qualifier that "During the months of March through June, the Declaration does not apply to proposed conjunctive use projects which are not dependent upon unappropriated water being available from the Mokelumne River in most years, but which could utilize unappropriated water in years when it is available."[1] Application 29835 depends on this qualifier.

Groundwater recharge is a new frontier in California water policy. The promise is that recharging aquifers will lead to a more reliable and sustainable water future for California. However, demand for water will continue to outstrip supply unless the State Water Board and water users address the existing and ever-increasing unsustainable demand for water. While California urgently needs projects that rectify the state's overdrafted aquifers, it is prudent that those in charge of such projects keep in mind how the State's aquifers became overdrafted in the first place.

Diverting water from the over-appropriated Mokelumne River would not be without cost to the environment and public trust resources. CSPA and The Center urge San Joaquin County and the Coordinating Committee leading MICUP to prepare an EIR that analyzes alternatives that are protective of ecosystems in the Mokelumne River, San Joaquin River, and Sacramento-San Joaquin Delta.

[1] California State Water Resources Control Board 1998, *Order WR 98-08*, California State Water Resources Control Board, viewed 29 July 2024, https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/1998/wro98-08.pdf, p. 32 (pdf).

Such an EIR must include a water availability analysis that does not presume all unappropriated flows to be excess flows. Modeling for bypass flow requirements should use more stringent conditions than those of the proposed Voluntary Agreements. The EIR should also investigate an alternative that includes bypass flow requirements of 55%-75% of unimpaired flow downstream of Camanche Dam.

The EIR must consider the Project's direct and cumulative impacts to threatened, endangered, and sensitive species. The EIR must incorporate the impacts of climate change on water resources into analyses of Project impacts. Finally, the EIR must consider the Project's direct and cumulative impacts to riparian habitats.

1. **The EIR must include a water availability analysis that does not presume unappropriated flows to be excess flows.**

In 2017 CSPA submitted comments on the 'Draft Water Available for Replenishment Report' (Draft WAFR Report). CSPA's comments on the Draft WAFR Report are attached as Appendix-1 to these scoping comments. The Draft WAFR Report "considered surface water available when streamflow exceeded existing water demands and minimum instream flow requirements, and provided some opportunity for additional beneficial use."[2] In its comments on the Draft WAFR Report CSPA contested this oversimplified narrative.

The EIR for MICUP should not assume that high flows exceeding minimum instream flow requirements are excess and therefore 'available' for appropriation. High flows are of benefit to the environment and public trust resources. High flows support migration of anadromous fish. High flows also replenish sediment that supports aquatic, terrestrial and avian species, and spawning and rearing of anadromous fish.

The natural flow distribution and processes of the Mokelumne River have been severely altered by impoundment, diversions, and other human uses. The State Water Board has designated the Mokelumne River as fully appropriated for most of the water year. Efforts to appropriate more water from the Mokelumne River should be done with great caution, if at all.

Groundwater replenishment is necessary in the Central Valley but should not come at the cost of the survival of species that depend upon surface water. Many wild fish species in the Bay-Delta and the Mokelumne River have been depressed due to the overall reduction in surface water flows. Using more surface water to maintain the status quo of excessive water use in California is not the path forward to groundwater sustainability.

The EIR for MICUP must provide a thorough assessment of the environmental benefit of high flows in the Mokelumne River and a thorough accounting of what flows, if any, can be appropriated for aquifer recharge without causing harm to the environment and public trust resources.

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[2] California Department of Water Resources. (2019). Water Available for Replenishment. [PDF] Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Statewide-Reports/WAFR/White-Paper---Water-Available-for-Replenishment_ay_19 pg. 19.

2. **Modeling for flows should use more stringent conditions than those of the proposed Voluntary Agreements.**

San Joaquin County and its partners must produce an EIR that is protective of anadromous fish and other flow dependent aquatic species in the Mokelumne River, San Joaquin River and the Sacramento-San Joaquin Delta.

An EIR that only uses the conditions proposed by the Voluntary Agreements (VAs) will not meet this requirement.

VAs for the Mokelumne River and those proposed for the Sacramento-San Joaquin Delta are not sufficient to protect fish and wildlife. The flows required under the VAs are inadequate and difficult to enforce. VAs also have a limited term of applicability, whereas a water right has no expiration date. It is not appropriate to rely on an explicitly time-limited requirement as a constraint on a water right.

Flows in the lower Mokelumne as mandated by the Joint Settlement Agreement (JSA) can be as low as 15 to 20 cfs below Woodbridge in September and October. These flows are inadequate to even maintain connectivity downstream of Woodbridge. In addition, the flows proposed in the Mokelumne River VA would not necessarily be additive to the flows required under the 1996 Joint Settlement Agreement that presently governs flows in the lower Mokelumne River, but rather would often simply change the timing of the same volume of flows.

Flows proposed in the VAs for the Bay-Delta are also inadequate to protect fish and wildlife. Native fish in the Bay-Delta are deprived of the freshwater flows they need to recover and thrive. The VAs reinforce current water management practices that have caused the depression of native fish species. Thus the EIR for MICUP should include water modeling based on more stringent conditions than proposed by the VAs.

3. **The EIR should also investigate an alternative that includes bypass flow requirements for the proposed new water right of 55%, 65%, 75% of unimpaired flow downstream of Camanche Dam.**

The EIR should evaluate a percentage of unimpaired flow bypass requirement should be made with the compliance point below Camanche Dam for Delta outflow. Even if the State Water Board does not adopt the Bay-Delta Plan, it is nonetheless appropriate that new water rights applications be held to this higher standard.

New water rights applications should not reduce Delta inflow and outflow over and above the conditions under the baseline or VAs. If the State Water Board does adopt a percentage of unimpaired flow as a regulatory requirement the bypass flow will take care of itself. An unimpaired flow of 75% is identified in the Delta Flow Criteria Report as being protective of the Delta. The EIR should evaluate adherence of new water rights to this requirement even if old water rights are not held to it.

This issue was examined as Alternative 6a in the Draft Staff Report for the update of the Bay-Delta Water Quality Control Plan with the rationale: "Because the VA flows are intended to be additive to required flows under D-1641 and resulting flows under the 2019 BiOps, additional mechanisms are needed to protect the base upon which the VA flows are intended to be additive from diversion."[3] Regardless of the potential adoption of the Voluntary Agreements or a regulatory update of the Bay-Delta Plan, State Water Board staff recognized in Alternative 6a the effective overallocation of water in the Bay-Delta watershed and the consequent need for stringent diversion criteria for diversions under new water rights.

4. **The EIR should include analysis of potential benefits of using existing works to divert allocated water.**

The natural features of the Mokelumne River have been highly altered by human use. The Mokelumne River is obstructed by seven reservoirs, four powerhouses, and a network of tunnels and flumes. These water development projects have caused the depression of native fish species, particularly by inhibiting up-river migration of Chinook salmon. An EIR that is protective of both wild and hatchery fish as well as other fish and wildlife impacted by construction would analyze the potential benefits of relying on existing works to divert any water that is allocated to Application 29835.

Using existing works for diversion would also be of benefit to San Joaquin County and partners as it would not require them to navigate the technical and regulatory challenges of building new works that alter the streambed. The time and expense saved by using existing works would make the goal of a high bypass flow requirement more attainable and feasible. This would be a more favorable outcome for fish and wildlife in the Mokelumne River watershed.

5. **The EIR should analyze the potential detrimental effect appropriation could have on groundwater reserves.**

Aquifers in San Joaquin County, the Central Valley, and other parts of California are overdrafted due to centuries of largely unregulated pumping of groundwater. The State Water Board considers many rivers in California to be fully appropriated. Many of the state's rivers are also, at times, completely dewatered for many miles of their reaches.

This systemic overallocation and overappropriation of water in California must cease in order to protect public trust resources. Application 29835 seeks to appropriate water from a river that is deemed to be fully appropriated for much of the water year. The EIR for MICUP must take into account the potential impact such appropriation could have on groundwater and surface water supplies in the Mokelumne River and beyond.

Unless the demand for water is brought into line with reliable supply, there is no path forward to sustainability. To meet such an objective, the EIR for MICUP should consider the potential of water right conditions that restrict the delivery of conjunctive use water to existing irrigated

[3]State Water Board, "Draft Staff Report/Substitute Environmental Document in Support of Potential Updates to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary for the Sacramento River and its Tributaries, Delta Eastside Tributaries, and Delta" (Sep. 2023), pp. 7.2-15 and 7.2-16.

acreage and disallow delivery of such water to new irrigated acreage.

6. The EIR must consider the Project's direct and cumulative impacts to threatened, endangered, and sensitive species.

The EIR must address the direct and cumulative impacts from both construction and operation of the proposed Project to threatened, endangered, and sensitive species and habitats within the project site and in the surrounding areas.

The proposed Project lies within an area that is important to numerous federal and state protected species, including the federal and state listed Chinook salmon (fall, winter, and spring run), steelhead, Delta smelt, western yellow-billed cuckoo, foothill yellow-legged frog, and many others. The impressive diversity of sensitive species found across the Mokelumne watershed underscores the ecological importance of the region.

The Mokelumne River is also one of the main tributaries of the Sacramento-San Joaquin Delta, an ecosystem that has been severely disrupted by water conveyance and continues to decline. The Project will likely lead to direct and indirect impacts on biological resources in the Delta, all of which should be thoroughly analyzed and evaluated in the EIR.

As described by the East Bay Municipal Utility District "The Mokelumne system and its associated habitats have been affected by human activities for more than a century, beginning with extensive gold mining in the 1850s. Since that time, riparian and instream habitats have been modified or converted for uses such as agriculture, gravel mining, water impoundments, increased water diversions, decreased instream flows, and levees. These major actions and other events have led to the deterioration of riparian and aquatic habitat conditions on the lower Mokelumne River."[4]

If Application 29835 was granted, up to 110,000 AF of water per year would be removed from the Mokelumne River to recharge groundwater aquifers. This withdrawal of surface water from the river could have significant impacts on wildlife and habitats. These include the downstream effects of reduced or altered flows, including temperature changes, turbidity, and water quality, among others.

The EIR must fully disclose and analyze impacts to any listed, candidate, or sensitive species, and discuss alternatives and enforceable mitigation measures to avoid, reduce, and mitigate impacts to the species. Enclosed is a species list that details the protected species that may be found within the Project area (See Appendix 2). All of these species and plant communities have been identified in previous projects [5] [6] as occurring in the vicinity of the lower Mokelumne River for part or all of their lifecycle. The EIR must therefore fully disclose and

[4] East Bay Municipal Utility District (2014, August) *Initial Study and Mitigated Negative Declaration for the Lower Mokelumne River Spawning and Rearing Habitat Improvement Project*.

[5] San Joaquin County Resource Conservation District; The Lower Mokelumne River Watershed Stewardship Planning Committee. 2002. Lower Mokelumne River Watershed Stewardship Plan.

[6] EBMUD. 2014. Initial Study and Mitigated Negative Declaration for the Lower Mokelumne River Spawning and Rearing Habitat Improvement Project.

analyze any impacts to these locally rare, state and federally protected species within the Project's footprint, including impacts to wildlife connectivity.

To that end, careful documentation of the current site resources is imperative to analyze how best to site the Project to avoid and minimize impacts, and to mitigate any unavoidable impacts. The EIR must include thorough, seasonal surveys performed for sensitive plant species, vegetation communities, and animal species under the direction and supervision of the land management and resource agencies such as the US Fish and Wildlife Service and the California Department of Fish and Wildlife with full disclosure of survey methods and results to the public and other agencies. Adequate surveys covering all likely seasons in likely conditions must be implemented to evaluate the existing on-site conditions. Complete surveys will allow the public and decision-makers to fully comprehend the scope of Project impacts.

Surveys for the plants and plant communities should follow California Native Plant Society (CNPS)[7] and California Department of Fish and Wildlife (CDFW) floristic survey guidelines[8] and should be documented as recommended by CNPS and California Botanical Society policy guidelines. A full floral inventory of all species encountered needs to be documented and included in the EIR.

Surveys for animals should include an evaluation of the California Wildlife Habitat Relationship System's (CWHR) Habitat Classification Scheme.[9] All rare species (plants or animals) need to be documented with a California Natural Diversity Database form and submitted to the California Department of Fish and Wildlife using the CNDDB's online submission form.[10]

The EIR must include an analysis of the direct impacts of MICUP, including potential reduced or altered flows, to biological resources within, adjacent to, and in the vicinity of the project site. In addition, the EIR must include a detailed analysis of the cumulative impacts of this project together with other completed, current, and reasonably foreseeable development projects in the area including, but not limited to, the Delta Conveyance Project.

The EIR must also include concrete, enforceable mitigation measures to reduce direct and indirect impacts to all protected species. If the direct and indirect impacts of the Project on biological diversity cannot be reduced with mitigation to less than significant, San Joaquin County should abandon the Project.

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[7] California Native Plant Society 2018, *CNPS Rare Plant Survey Protocol*, California Native Plant Society, viewed 29 July 2024, https://cnps.org/wp-content/uploads/2018/03/cnps_survey_guidelines.pdf.
[8] California Department of Fish and Wildlife (2024) *Survey and Monitoring Protocols and Guidelines*, [online] Available at: https://wildlife.ca.gov/conservation/survey-protocols [Accessed 29 July 2024].
[9] California Department of Fish and Wildlife (2024) *California Wildlife Habitat Relationships (CWHR)*, [online] Available at: https://wildlife.ca.gov/Data/CWHR [Accessed 29 July, 2024].
[10] California Department of Fish and Wildlife (2024) *California Natural Diversity Database (CNDDB) Submitting Data*, [online] Available at: https://wildlife.ca.gov/Data/CNDDB/Submitting-Data#44524419-online-field-survey-form [Accessed 29 July, 2024].

7. **The EIR must incorporate the impacts of climate change on water resources into analyses of Project impacts.**

The EIR must also incorporate the impacts of climate change on water resources into analyses of Project impacts. Climate change is expected to decrease snowpack, lower spring and summer streamflow, increased evapotranspiration, more extreme storms, and decreased water quality during droughts, among others. As stated by the California Water Plan 2023 Update issued April 3, 2024:

> In the five-year period since the publication of California Water Plan Update 2018 (Update 2018), climate change has put unprecedented stress on natural and human systems. During that time, Californians experienced increased wildfires, rising sea levels, and highly variable precipitation and runoff patterns that manifested as historic droughts and floods — all of which increased socio-economic uncertainty. Although climate change certainly is not the only water-related challenge disrupting natural and human systems, all water sectors are vulnerable to its interrelated impacts.[11]

8. **The EIR must consider the Project's direct and cumulative impacts to riparian habitats.**

The EIR must assess and mitigate the Project's impacts to riparian corridors and the cascading effects of removed habitat and connectivity, reduced groundwater, and ongoing climate change on the special-status species and other animals and plants that rely on these habitats.

Riparian habitats can provide some resilience to climate change. The canopy cover of riparian trees and the availability of groundwater have a cooling effect for both air and water temperatures, which creates a cooler microclimate for species to find refuge from a warming climate.[12] Such connectivity also helps animals and plants adjust to shifts in resource availability and maintain a suitable climate space as climate change alters habitats and ecological processes and causes shifts in species' ranges .[13] Removing already limited water could compromise the integrity and functionality of the riparian ecosystems in and near the Project area.

With the driest 22-year period in 1,200 years in the western US and drought conditions that will likely continue[14] climate change refugia and resilience provided by ecosystems like riparian areas will be ever more critical for species survival and ecosystem health. As

[11] California Department of Water Resources (2024, April 3) California Water Plan 2023 Update: Executive Summary, p. ES-1.
[12] Gray, M., Micheli, E., Comendant, T., & Merenlender, A. (2020). Quantifying climate-wise connectivity across a topographically diverse landscape. Land, 9(10), 355.
[13] Cushman, S. A., McRae, B., Adriaensen, F., Beier, P., Shirley, M., & Zeller, K. (2013). Biological corridors and connectivity. In D. W. Macdonald & K. J. Willis (Eds.), Key Topics in Conservation Biology 2 (First Edit, pp. 384–403). John Wiley & Sons, Ltd.
[14] Williams, A. P., Cook, B. I., & Smerdon, J. E. (2022). Rapid intensification of the emerging southwestern North American megadrought in 2020–2021. Nature Climate Change.

discussed in a 2021 Center report:[15]

> Climate change is worsening ecosystem stress and species extinction risk .[16] Increasing variability and extremes in temperature, wind, and precipitation are all products of a warming climate, leaving species struggling to adapt. As a result, species' genes are changing, physiological and physical features such as body size are changing, ranges are shifting as species try to maintain a suitable climate space, and numerous species are expressing new breeding and migration behaviors[17].

For example, some plants are budding and flowering earlier, some marine and freshwater fishes are spawning either earlier or later, and some species with temperature-dependent sex determination are experiencing shifts in sex ratios. ***Climate-related local extinctions have already occurred in hundreds of plant and animal species*** .[18] One study found that terrestrial bird and mammal populations that are experiencing greater climate warming are more likely to be experiencing greater population declines[19].

Reportedly, climate change is already impacting 82% of key ecological processes that form the foundation of healthy ecosystems .[20] If climate change goes unabated, more than one-third of all plant and animal species could become extinct in the next 50 years.[21]

Wildlife connectivity is critical for biodiversity resilience and climate change adaptability. A permeable landscape that has multiple pathways or linkages between habitat patches allows a wide variety of species to adjust to shifts in resource availability.[22] For smaller species with poor dispersal abilities, like San Francisco garter snakes, CRLF and San Bernardino kangaroo rats, multiple linkages can provide habitat while still allowing for their dispersal.

Multiple connections also help populations persist after extreme events worsened by climate change. During floods, landslides or wildfires, these pathways provide escape routes or refugia for animals seeking safety . Such events can cause local extinctions in small, isolated populations.

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[15] Yap, T. A., Rose, J. P., Anderson, I., & Prabhala, A. (2021). California Connections: How Wildlife Connectivity Can Fight Extinction and Protect Public Safety.

[16] Trisos, C. H., Merow, C., & Pigot, A. L. (2020). The projected timing of abrupt ecological disruption from climate change. Nature, 580, 496–501.

[17] Scheffers, B. R., De Meester, L., Bridge, T. C. L., Hoffmann, A. A., Pandolfi, J. M., Corlett, R. T., Butchart, S. H. M., Pearce-Kelly, P., Kovacs, K. M., Dudgeon, D., Pacifici, M., Rondinini, C., Foden, W. B., Martin, T. G., Mora, C., Bickford, D., & Watson, J. E. M. (2016). The broad footprint of climate change from genes to biomes to people. Science, 354(6313).

[18] Wiens, J. J. (2016). Climate-related local extinctions are already widespread among plant and animal species. PLoS Biology, 14(12), 1–18.

[19] Spooner, F. E. B., Pearson, R. G., & Freeman, R. (2018). Rapid warming is associated with population decline among terrestrial birds and mammals globally. Global Change Biology, 24, 4521–4531.

[20] Scheffers et al. (2016)

[21] Román-Palacios, C., & Wiens, J. J. (2020). Recent responses to climate change reveal the drivers of species extinction and survival. Proceedings of the National Academy of Sciences of the United States of America, 117(8), 4211–4217.

[22] Mcrae, B. H., Dickson, B. G., Keitt, T. H., & Shah, V. B. (2008). Using circuit theory to model connectivity in ecology , evolution , and conservation. Ecology, 89(10), 2712–2724.

The EIR must therefore assess and mitigate the Project's impacts to riparian habitats as well as habitat connectivity in the context of a changing climate and increasing drought conditions. One possible form of mitigation is the creation or enhancement of floodplain habitat that can also serve to recharge groundwater.

Conclusion

Water in California is overallocated and overappropriated. Too much is promised, too much is delivered, and not enough is left in rivers and in the ground. The result is ecosystem collapse, sinking land, and dry wells.

Projects that aim to replenish depleted aquifers are needed, but should not come at the cost of further degradation of the state's rivers, fish and wildlife, and the people who depend on these resources.

Application 29835 seeks to divert water characterized as "excess" to replenish San Joaquin County's overdrafted aquifers. Flood stage water in the Mokelumne River provides crucial flows to many flow dependent aquatic species. Flood stage water is not synonymous with excess water. An EIR for Application 29835 and MICUP must prioritize the protection of these already imperiled hydrological and biological resources.

Respectfully submitted,

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Appendix 1

California Sportfishing Protection Alliance

December 5, 2017 Comments

'*Flood MAR – Using Flood Water for Managed Aquifer Recharge to Support Sustainable Water Resources'*
(November 2017)

California Sportfishing Protection Alliance

"An Advocate for Fisheries, Habitat and Water Quality"

Chris Shutes, Water Rights Advocate
1608 Francisco St., Berkeley, CA 94703
Tel: (510) 421-2405 E-mail: blancapaloma@msn.com
http://calsport.org/news/

December 5, 2017

Ms. Jennifer Marr
Statewide Infrastructure Investigations Branch
Division of Statewide Integrated Water Management
California Department of Water Resources
Jennifer.Marr@water.ca.gov
Via e-mail

Dear Ms. Marr:

The California Sportfishing Protection Alliance (CSPA) respectfully submits these comments on the Discussion Draft of the White Paper entitled *Flood MAR – Using Flood Water for Managed Aquifer Recharge to Support Sustainable Water Resources* (November, 2017, hereinafter *MAR Discussion Draft*).

CSPA believes there may be opportunities for managed groundwater recharge using high flows in rivers in some circumstances. However, CSPA is concerned about the loss of surface flows, particularly in watersheds that are already over-appropriated and in rivers in which required flows are already insufficient.

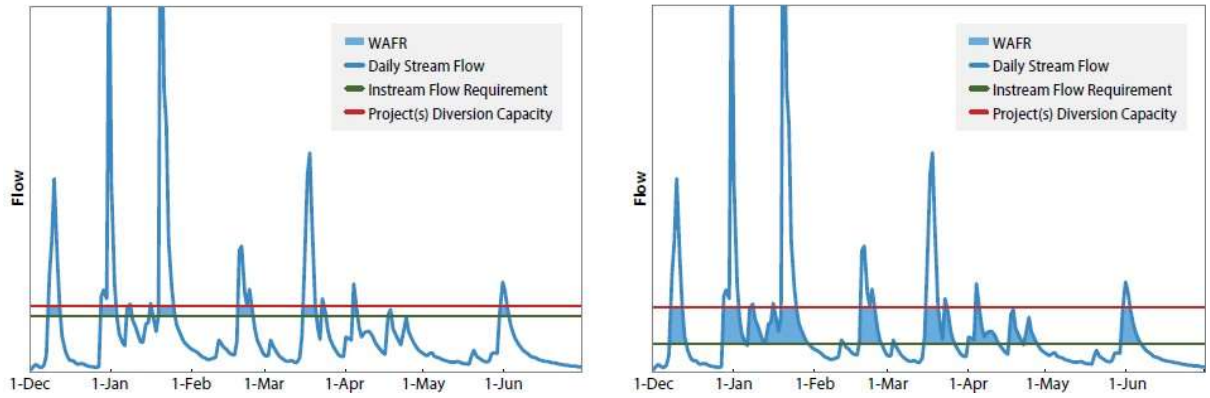
The diversion of surface water to groundwater in overappropriated watersheds and/or from rivers whose flow requirements are inadequate to protect instream resources defeats the stated purpose of increasing sustainability. Therefore, CSPA recommends several general approaches for placing appropriate limits on diversions of surface water to groundwater. CSPA also recommends several policy approaches that may benefit surface water and groundwater resources, as well as the people and other life forms that these resources support. Finally, CSPA comments on the necessary legal framework for using surface water to replenish groundwater.

Hydrological framework of "flood flows"

The *Draft Water Available for Replenishment Report* (hereinafter, *Draft WAFR Report*, January, 2017 available at: https://d3.water.ca.gov/owncloud/index.php/s/FUKYqcl1LblWTeZ) recognized that there is a potential range of surface water that may be available for replenishment of groundwater. This range depends on both regulatory and physical limitations. Generally, pages 25-27 of the *Draft WAFR Report* discuss these options. The *MAR Discussion Draft* figures 7 and 8 borrow from pages 25-27 of the *Draft WAFR Report*.

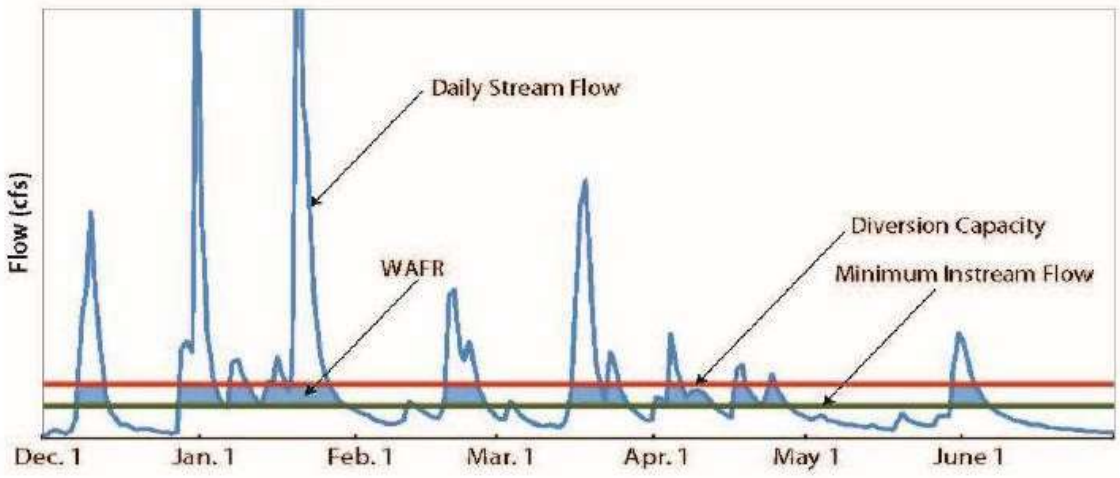
Below is pasted Figure 4 from p. 25 the *Draft WAFR Report.* This figure conceptually demonstrates potential ranges of surface water available for groundwater replenishment.

Figure 4. Lower Uncertainty Range Estimate (left) Upper Uncertainty Range Estimate (right) Conceptual Projects, with WAFR for Multiple Streams



The present *MAR Discussion Draft* downplays the important nuance that the potential range incorporates. Figure 7 in the *MAR Discussion Draft* is pasted below:

Figure 7. Surface Water Available for Replenishment



The narrative in the *MAR Discussion Draft* that is directly below this Figure 7 reads as follows:

> This white paper uses the term high flows to designate the flows in a channel that are above regulatory instream flow requirements (the combination of regulatory environmental/water quality flows and water required to satisfy water rights). A similar designation was used in the WAFR analysis conducted for SGMA. It generally considered surface water available when streamflow exceeded existing water demands

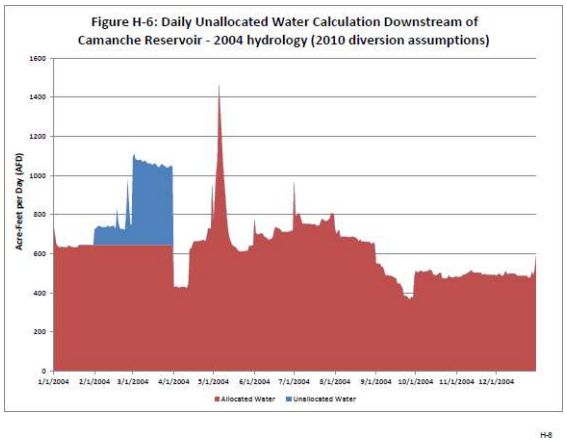
and minimum instream flow requirements, and provided some opportunity for additional beneficial use. (*MAR Discussion Draft*, p. 19).

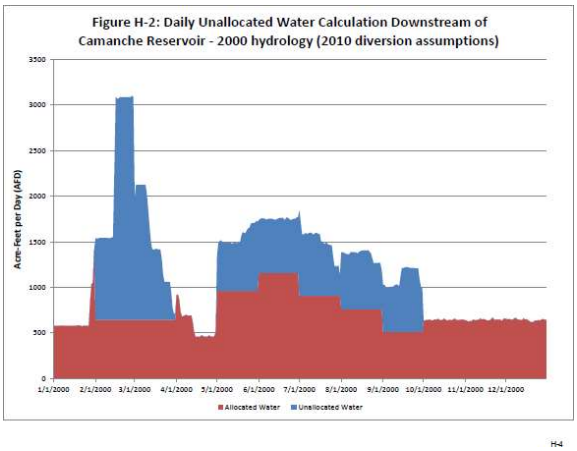
This narrative on p. 19 of the *MAR Discussion Draft* contains an oversimplification that obscures a fundamental point. All streamflow in a river that exceeds "existing water demands and minimum instream flow requirements" is not necessarily ***available*** for appropriation for groundwater replenishment or any other particular use. It is fair to say that it is unallocated or unappropriated. However, whether it is "available" is a legal and regulatory question that requires definition.

The figures pasted above are helpful in conceptualizing availability. However, it is important to recognize their limitations. The hydrographs represented above generally represent an unregulated system, or a system without storage. These hypothetical hydrographs are driven by unimpaired flow. In an unregulated system, setting a higher minimum instream flow does more than allow less total diversion of water out of the system. It also maintains much of the hydrological variability that is achieved during small flow pulses. In the contrasting hydrographs shown above from Fig. 4 of the *Draft WAFR Report*, a regulatory requirement that allowed the lower minimum flow in the hydrograph on the right would mostly or entirely eliminate the small flow spikes that (without diversion for replenishment) currently appear in January, April and May.

If the hydrographs above represented a regulated system, the green line would be the required minimum instream flow. Assuming it was on hand, storage would make up the differential between the blue line and the green line whenever the blue line fell below the green line. Thus, the blue line would follow the green line in those cases where the blue line now falls below the green line. A real-world example is found in the two figures of hydrographs pasted below that represent actual annual flow in the Mokelumne River at the Camanche gage just downstream of Camanche Dam. These are from the document entitled "*MokeWISE Program Final Memorandum*: *Water Availability Analysis* (9 Jan. 2015). The document is available at: https://azslide.com/appendix-g-water-availability-analysis_59c210bc1723dd7d5d1d1ed1.html[1] Note that the units for the y-axis in the hydrographs below are acre-feet per day, not cfs.

[1] "MokeWISE" was a voluntary stakeholder collaborative funded by a DWR grant. The collaborative evaluated opportunities and obstacles for water development projects in the Mokelumne River watershed, as well as opportunities for habitat improvements, and issued a final report. Appendix G of that report is titled "Water Availability Analysis" and is the source of the figures below.





Each hydrograph above represents a calendar year. The red shaded area represents "allocated water": water that is required for minimum instream flow plus water released to meet downstream water deliveries. The blue shaded area represents "unallocated water." Note that the scales on the y-axis are different: 2000 was a much wetter water year than 2004 in the Mokelumne watershed.

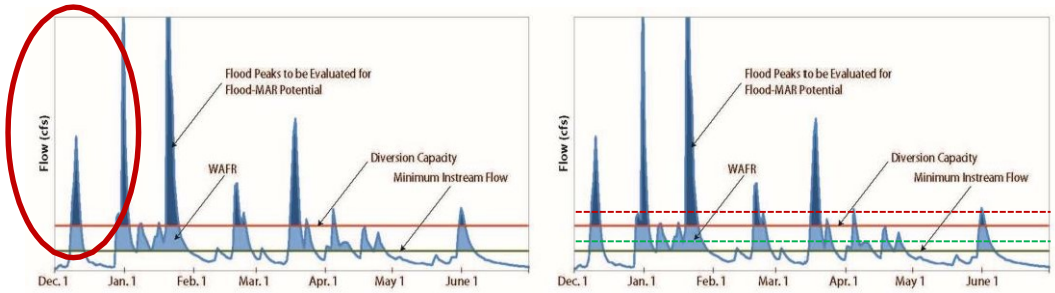
In the left-hand hydrograph above (for the year 2004), the horizontal line at the top of the red area in the first three months generally represents the flow requirement: there are few required downstream deliveries until the irrigation season starts. The blue area from about February 1 through April 1 represents flood releases. In 2004, irrigation deliveries evidently started in mid-April, which is apparent from the sharp increase in releases at that time. By the beginning of October, releases are once again largely limited to the required instream flow; the required flow increased on October 1. Since 2004 was a relatively dry year, there were no flood releases after the spring. The large spike on about the first of May was likely a release to stimulate outmigration of juvenile salmon.

The right-hand hydrograph above (for the year 2000) shows the hydrograph for a wetter water year. Wet year minimum flows are higher. Irrigation deliveries did not start until about May 1. There are two sets of flood releases in 2000: one set in the winter and spring to stay under the flood curve, and a second set from late spring into the fall to bring Camanche Reservoir down to the winter flood storage curve that goes into effect in early November. As CSPA understands East Bay Municipal Utility District's (EBMUD) operation of Camanche Reservoir, the timing and volumes of the spring releases in the winter-spring of 2000 were largely required by the Army Corps' flood curve. However, while the volume of the summer-fall releases was largely required by the Army Corps' requirement to draw down the reservoir to a specified level, EBMUD had considerable discretion about the timing of the summer-fall releases.

Additional approaches to defining water available for replenishment: unregulated systems

Using the hydrographs reproduced above for both unregulated and regulated systems, it is possible to consider additional approaches to defining "available" water.

The *Draft WAFR Report* contemplates different minimum flow levels (as in the unregulated hydrographs shown above). Below certain levels, no diversions for replenishment would be allowed. But above the minimum flow level, diversion would be allowed up to the capacity of the diversion works. A different approach would be to allow no diversions from the first two pulses of the water year, as illustrated in the modified hydrograph shown on the left below:



No diversion for replenishment would be allowed of the pulses inside the red circle. A variation on this approach would be to set a threshold in acre-feet, prior to which no diversions for replenishment would be allowed. One could compare this to a deductible in an insurance plan.

A second variation, shown on the right above, would be to restrict diversions above a specificed minimum instream flow to a ***percentage*** of the flow above the minimum. One could compare this to a co-payment in an insurance plan. Limiting diversion to a percent of flood flows (flows above the minimum required flow and the flow needed to meet existing deliveries) would have the effect of maintaining some of the shape of the hydrograph. It would also increase the flow level at which the capacity of the diversion works was reached. While it is more difficult to demonstrate this visually on a conceptual graph (i.e., without re-graphing actual data), the dotted green line represents where the hydrograph in the range below the dotted red line might peak if the hydrograph did not exceed the dotted red line.

The set of hydrographs from the Mokelumne reproduced from the MokeWISE Report above allows visualization of the additional conceptual approaches in a regulated system to the use of "flood flows" for groundwater replenishment.

In a year like 2004 (Figure H-6), the total amount of flood flows was on the order of 15,000 acre-feet: 400 acre-feet per day for about a month, plus a small additional increment. In this circumstance, it would be appropriate to disallow any diversion for groundwater replenishment. The instream benefit would greatly outweigh the recharge benefit. The "deductible" concept would be appropriate here.

In 2000 (Figure H-2), there were two distinct sets of flood releases. The first was during the time when unregulated runoff was entering Camanche Reservoir (and EBMUD Pardee Reservoir immediately upstream of Camanche). Although it would be appropriate to limit diversion for replenishment to a percentage of the flood flows, in much of this year the size of any diversion works would likely limit such diversion to a small percentage in any case. A good rule of thumb for required pass-through of inflow to the Bay-Delta would be a percent of

February-June unimpaired flow, as suggested conceptually by the State Water Board for the update of the Bay-Delta Plan.

The summer "flood flows" shown in the Mokelumne River in the year 2000 represent release of stored water from EBMUD's facilities or from PG&E's reservoirs farther upstream. Much of the Mokelumne River fisheries benefit of these releases would be improved water temperature for resident or oversummering *O. mykiss*. However, flow through the Delta could also be beneficial in maintaining the Low Salinity Zone west of the Delta. A percent of the flow would again be an appropriate consideration.

One can imagine a situation in which an entity would pay EBMUD to store water in Camanche Reservoir for summer release for downstream replenishment. This opportunity might be exercised in drier years, so that some recharge benefits were gained and diversion facilities could be used even in years without flood flows. Under these circumstances, it is more conceivable that full diversion of this stored water would be allowed. The release of this stored water, over and above minimum requirements and water needed for other downstream diverters, could still have a summer water temperature benefit in the Mokelumne River upstream of the point of diversions, assuming of course that the river would be used for conveyance to the point of diversion for groundwater replenishment.

Water Rights

Another way of making the diversion of surface water for groundwater replenishment more acceptable is to use existing water rights. This is particularly important in overappropriated watersheds. Bluntly, senior diverters in some overappropriated watersheds need to reduce their irrigation diversions in order to maintain a sustainable water balance. The over-diversion of water, particularly to new acreage, consititutes in the opinion of CSPA an unreasonable use of water. One way of maintaining the water rights associated with these senior diverters would be to require a reduction of irrigation diversions and routine water sales from the baseline condition, but to allow diversion for groundwater replenishment up to the full amount of the water right in very wet water years such as 2017.

If, for example, an irrigation district were required to reduce its baseline diversions by 10% in all water years, it could divert up to that 10% for groundwater replenishment in very wet years like 2017. In most watersheds, there would still be substantial flood flows in years like 2017 that were not diverted for replenishment or for irrigation. This would be a more sustainable business model than the current rags-or-riches paradigm that plagues irrigators in many watersheds. Under an improved model, irrigation districts would deliver as a baseline condition an achievably smaller but more reliable amount of irrigation water. Using the generally unused portion of their water right for replenishment in very wet years would create a more reliable groundwater situation to call on in critically dry years or in dry year sequences.

In any event, there are additional water rights concerns that groundwater replenishment raises. Groundwater replenishment is not a designated beneficial use. CSPA does not support making it one. Allowing water rights simply to divert surface water to underground storage will in all likelihood perpetuate the rob-Peter-to-pay-Paul paradigm that water users in many

overappropriated watersheds seem all too eager to apply. Devoting a portion of existing rights to recharge, within the constraints of reasonable use, is a better model. New rights may be possible, with long-term demonstration of beneficial use of water. However, new rights would need to be carefully conditioned in recognition of the importance of flood flows and would need to preserve the value and instream functions of existing flood flows.

Finally, diverting water for groundwater replenishment under a never-ending series of temporary rights or emergency proclamations is unacceptable. Groundwater replenishment is going to occur. It needs an appropriate legal framework. It needs real water rights for the diversion of surface water. It needs CEQA review.

Conclusion

In sum, the presence of water in a surface river or stream, over and above the sum of the required minimum instream flow and water required for existing diversions, does not make that water "available" for replenishment. It is important to maintain the existing benefits of high flows. This letter has suggested some conceptual approaches to maintaining those benefits, keeping any diversion of surface water for groundwater replenishment within the framework of reasonable use. In addition, the use of surface water for groundwater replenishment needs to take place within the appropriate legal framework of real (not temporary) water rights and CEQA review.

Thank you for the opportunity to comment on the Discussion Draft of the White Paper entitled *Flood MAR – Using Flood Water for Managed Aquifer Recharge to Support Sustainable Water Resources.*

Respectfully submitted,

Chris Shutes
Water Rights Advocate
California Sportfishing Protection Alliance

Appendix 2

Non-exhaustive list of species potentially present in and around the lower Mokelumne River

Appendix 2

Non-exhaustive list of species potentially present in and around the lower Mokelumne River. FT=federally threatened, FE=federally endangered, ST=state threatened, SE=state endangered, SSC=species of special concern, FP=fully protected, WL=watch list.

Species	USFWS Designation	CDFW Designation
vernal pool fairy shrimp (Branchinecta lynchi)	FT	
valley elderberry longhorn beetle (Desmocerus californicus dimorphus)	FT	
vernal pool tadpole shrimp (Lepidurus packardi)	FE	
Delta smelt (Hypomesus transpacificus)	FT	SE
Central Valley steelhead Oncorhynchus mykiss	FT	
Spring-run Chinook salmon (Oncorhynchus tshawytscha)	FT	ST
Fall-run Chinook salmon (Oncorhynchus tshawytscha)	FT	
Winter-run Chinook salmon Oncorhynchus tshawytscha	FE	SE
California tiger salamander, central population (Ambystoma californiense)	FT	ST
California red-legged frog (Rana draytonii)	FT	SSC
Western spadefoot toad (Spea hammondi)	Proposed FT	
Foothill yellow-legged frog (Rana boylii)	FE	SE
Giant garter snake (Thamnophis gigas)	FT	ST
Western pond turtle (Actinemys marmorata)	Proposed FT	
Bald Eagle (Haliaeetus leucocephalus)	-	FP
Bank Swallow (Riparia riparia)	-	ST
Burrowing owl (Athene cunicularia)	-	SSC
Common Loon (Gavia immer)	-	SSC
Golden Eagle (Aquila chrysaetos)	-	FP
Osprey (Pandion haliaetus)	-	WL
Prairie Falcon (Falco mexicanus)	-	WL
Swainson's hawk (Buteo swainsoni)	-	ST
Tricolored blackbird Agelaius tricolor	-	ST
White-tailed kite (Elanus leucurus)	-	FP
Yellow-breasted chat (Icteria virens)	-	SSC
Mountain plover (Charadrius montanus)		SSC
Western yellow-billed cuckoo (Coccyzus americanus occidentalis)	FT	SE
Greater sandhill crane (Grus canadensis tabida)	-	ST
California black rail (Laterallus jamaicensis coturniculus)	-	ST
Cooper's hawk (Accipter cooperi)	-	WL
Short-eared owl (Asio flammens)	-	SSC
Northern harrier (Circus cyanus)	-	SSC
Yellow warbler (Setophaga petechia)	-	SSC
Ringtail/ringtail cat (Bassaricus astutus)	-	FP