Rainfall to Groundwater

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California Water Commission Members and Staff
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RE: Agenda items 8 (and 12), Feb. 18, 2026 Commission Meeting
Attached: Rainfall to Groundwater Executive Summary July 2021

Dear California Water Commission Members and Staff,

This is only the second time you have heard from me, the first being my Dec. 13, 2021 comments re Prop 1 WSIP Feasibility Determination for Pacheco Dam Project, Dec. 15, 2021 Commission Meeting. The primary impetus for my writing to you today is my review of the highlights of some of your January meeting, posted on Maven's Notebook as, "Water Commission: Building California's water future: DWR's framework for the 2028 Water Plan and SB 72 implementation", Feb. 4, 2026. I understand that your Feb. 18 agenda includes further consideration of those topics under agenda item 8. I also wish to express some of my perspective on the proposed Sites WSIP project, though it may be anathema to the labor considerations noted under agenda item 12. Everything covered in that Maven's Notebook summary was new to me (other than having seen some of it previously in Maven's Weekly Water Blast) and I'm admittedly reacting to it in writing these comments..

To expedite my communication I'm attaching my July 2021 Rainfall to Groundwater (R2G) Executive Summary, despite that some parts are becoming dated in my view. No need to review that ahead of the Feb 18 meeting — please peruse it at your leisure. I simply want to get a "foot in the doorway" for consideration of an alternative water storage strategy that you won't be hearing about from DWR (or the Sites proponents) but has the potential to equal or surpass that 9 million acre-feet target figure.

For the past several years I've been working toward a scholarly yet interdisciplinary (hopefully broadly understandable) articulation of an overlooked *nature-based* approach to ameliorating stressors on aquatic ecosystems while simultaneously increasing water storage for human needs that is applicable to many watersheds/ catchments in northern

and central California. I have long been attempting to bring this approach to the attention of California water agencies, who, alas, seem receptive only to *engineered (a.k.a. plumbing)* solutions — despite Governor Newsom's call for nature-based solutions.

Having gained no traction on this approach since I first began proposing it to DWR in 2009 (i.e., pre-SGMA), I am currently working toward completion of the scholarly, book-length articulation that I plan to publish online, on a preprint server for open peer review, as soon as possible this year. The working title is,

California Opportunities to Increase Natural Recharge, Baseflows and Detention Storage Hide in Plain Sight

My entire website is about this approach, but I recognize that few, if any, onlookers have grasped the concept or potential — hence the impetus for the scholarly, open access document, hoping to at least get some scientists on board. Please see the two slides at the top of my Rainfall to Groundwater Front Page or Figure 4. Holistic Restoration Concept, p 14 of the R2G Exec Summary, for an early conceptual graphic model. (I plan to work on refined concept graphics after posting the text as preprint.) The web Front Page text offers an overview and I trust the links there, along with the menu, facilitate perusal of some of the rest.

Essentially, I propose restoration of historically degraded catchment functions to increase infiltration and "percolation" — more accurately, *preferential flows* through the vadose zone — of rainfall to groundwater. In California, the most expansive areas of degraded catchment functions are represented by the vast rangelands dominated by nonnative annual grasslands.

Rainfall to Groundwater is an extension of my late-in-life, interdisciplinary doctoral dissertation, "Watershed restoration for baseflow augmentation" (Jigour, 2008 (2011)), abstract here. The GIS database I created around the turn of the millennium, of steelhead streams *and their watersheds*, from SF Bay Area to San Diego Co., afforded quantitative estimates of opportunities for restoration of catchment functions in especially the Central West Ecoregion (a.k.a. Central Coast). As noted in the abstract, especially significant opportunities lie in the inland and upper Salinas, and upper Pájaro River watersheds, Another standout is striking opportunities in the Alameda Creek watershed (Zone 7 water agency). I plan to (finally) publicly share those data among the Supplemental Materials to the forthcoming preprint, as they always needed such context for comprehension.

I did not go the traditional route of publishing journal articles based on my dissertation because the holistic approach just doesn't fit into a single or even a couple journal articles. And paradigmatic issues seem the biggest block to recognition/ acceptance. But remember, it was already peer reviewed by my five doctoral committee members, along with outside reviewers.

Furthermore, soon thereafter, results began to be published from Critical Zone (National Research Council, 2001) geophysical research projects in California. Those results have literally deepened our understanding of how precipitation moves through the vadose zone to weathered bedrock aquifers, which have been shown to host the greatest potential detention storage — actually rather astonishing volumes (McCormick et al., 2021).

Know this: the roots of trees and other woody vegetation, along with their soil ecosystems, facilitate preferential flows through the vadose zone to those weathered bedrock aquifers, from which most continues to flow downstream to alluvial aquifers (from which most groundwater is extracted), associated streams/ rivers and thence to the ocean. Where woody plants have been diminished or removed entirely through historical human land uses, catchment functions have degraded. "*California Opportunities* …" also discusses impacts on streambank storage due to historical dredge tailings, using the examples of the Merced R. floodplain, as well as Moccasin Canyon on the Tuolumne watershed.

DWR and probably most other water agencies, including those with flood control responsibilities, remain essentially blind to the potential streambank detention storage lost to such dredge tailings, as well as to historically eviscerated rangeland riparian zones, let alone the vast potential in degraded uplands. Such detention storage serves not only to reduce flood hydrograph peaks, but to extend the residence time of that moisture on the land, promoting natural recharge and baseflow water quality supporting freshwater and estuarine ecosystems. But these professionals can't see the potential because they view the world through purely physics-based engineering equations and software, despite that the real world teems with life that doesn't obey their equations.

Having previously noted that I first began attempting to essentially "give this concept away" to DWR in 2009, I wish to elaborate a bit on my fruitless efforts to get that agency and then CNRA, to even open their minds a wee crack to the potential for a watershed/ catchment restoration approach. Really, given California's pressing water problems one might think public agencies in a so-called progressive state might be open to considering new ideas, no? But no, they've blown me off in every case.

Again, based on my review of the previously linked Maven's Notebook Feb. 4 summary, with regard to "Outreach and Collaboration", I fear that my views will be swamped out because: 1.) I am just one person, not an environmental group, albeit with a pertinent PhD., and 2.) my proposed approach is applicable to several regions, as you'll note in the satellite image included in the R2G Exec Summary Figure 3. Rangeland Opportunities for Rainfall to Groundwater, p 11. As just a single person, must I participate in all those regional input meetings to be heard? Based on past experience with DWR, I don't plan to participate in their process at all — I'm doing my own thing and hope to convince water users directly that there are less costly, more environmentally harmonious ways to expand water storage than the gray infrastructure that is DWR's area of specialization.

Given that my Master of Landscape Architecture degree combined both environmental planning and design, providing input to the California Water Plan 2010 seemed a natural place to share what I'd learned about catchment functions with the agency most in charge of our state's water resources. At that time the plan was divided by regions and I addressed my comments to the plan as a whole, along with separate comments re the Central Coast region. I included an earlier version of the two slides on my Rainfall to Groundwater Front Page that also appear as Figure 4. Holistic Restoration Concept, on p 14 of the Exec Summary. [I made only a slight change to a key line in those diagrams between 2009 and the final 2010 version — artifact of my infrequent use of Adobe Illustrator.]

Back then, Draft Water Plan public comments were made available on a DWR website. The only indication I ever received of any acknowledgement of my comments came in 2015 when a chap I met at a rangelands conservation field meeting recognized my name from those 2009 comments (!). That fellow happened to be the former USFS hydrologist who managed to get DWR on board with Prop. 1 funding for (solely Sierra Nevada) meadow restoration and he had used some of the same citations I did. Those parentheses are there because the concept is far more broadly applicable than to just the Sierra Nevada, but I suppose the funding was biased toward support of the State Water Project.

I enumerated how many times DWR, then CNRA, ignored my input in my last blog post in May, 2022, What About This "Damn Tool", Gov. Newsom?, so won't reiterate that here, and in the last post linked in the R2G Exec Summary, Newsom Administration – Progressive on Water Resources? I note an error in the 2018 Water Plan that went uncorrected despite my pointing it out to DWR during the draft circulation — evidence of how they simply ignore public input that does not correspond with their predetermined civil engineering agenda.

'Happens that a few months prior to the time of that last blog post [my next post, BTW, is planned to announce publication of my preprint] I actually had been participating in DWR's online meetings pursuant to Water Plan 2023. In that case I don't have records of my early input because it was all into online functions (and by then I did view the process somewhat skeptically). In any case, I know one of my inputs concerned the significance of vegetation cover to watershed/ catchment functions. Some months later I received word that DWR was arranging a Teams meeting to show me how they were addressing my concerns.

I sincerely appreciate that one of their senior staffers made time to meet with me on this but the net effect for me was to throw my hands up at the prospect of ever being able to communicate with these professionals who understand only equations and software based on purely physical laws. What that staffer shared with me was a nascent version of the Watershed Management Resource Management Strategy (RMS) that was solely about ***people — absolutely <u>nothing</u> about how watersheds/ catchments <u>function</u>***.

Ok, so DWR shifted that particular RMS to Dept. of Conservation. Reflecting back, I recall that in one of my numerous previous comment letters to DWR I may indeed have asked what had happened to the State's Watershed interest, having had one or two of my past watershed restoration projects (circa 2000?) featured on a state website about that. Perhaps that old website was managed by Dept. of Conservation and that's why they were given the task for this RMS. In any case, I recall my first reaction to it was, "Oh, everyone gets together, sings Kumbaya and all our water problems will be solved, eh?"

I did comment to that staffer, who apparently manages flood control planning, that DWR doesn't even consider streambank storage and suggested that DWR might calculate the streambank storage lost to dredge tailings on the Merced River floodplain — Nada, of course. I did peruse the final Watershed Management RMS and thought it much improved in refinement, but it is still focused on people; shares absolutely nothing about how (especially healthy) watersheds/ catchments function. While the Dept. of Conservation authored the RMS, I submit that is at least partly because DWR is itself *clueless* about catchment functions. And that was the last of my involvement with DWR's Water Plan process. I might as well be a space alien for how DWR interprets my comments — I think we indeed live on separate planets.

Frankly, I suspect that DWR has no actual hydrologists on staff, that their expertise lies solely in civil engineering, whose trade is limited to either surface waters or groundwater

but almost never the interface between them — partly because that's where biology/ecology especially defies their equations reliant on solely *physical* laws. I'm striving to make clear for all in my forthcoming preprint how that interface matters for California water resources, as well as how historical land uses have degraded catchment functions. DWR has no expertise at all in how catchments function so they have simply ignored my input about it at every step — ignored out of ignorance. Yet our state politicians have been bamboozled into believing they are the only experts. And water rate payers are the losers in this insistence on costly gray infrastructure approaches as the only solutions to California water needs.

Which brings me to my brief comments on Agenda item 12. I realize you are far down the path of approving Sites for major funding, but I have long viewed the catchment restoration I propose as a much more cost effective, environmentally sound alternative to projects like the proposed Sites Reservoir, so at least I can have my say here and now. During the Commission's early review of the Sites project I could only spare time for comments on the now-defunct Pacheco Reservoir expansion project, especially offended by Valley Water's absurd, "Disneyland"-like approach to "creating steelhead habitat". But I have long been appalled by what I know about the Sites project — again, with a more environmentally benign, far less costly alternative in mind.

Having lived in Davis during my undergrad years in the late 1970s to early 80s, including summers, I do recall the hot, dry winds blowing down the Sacramento Valley and the proposed Sites Reservoir hits me like holding a shallow bowl of water up to those sunny hot winds, which are apparently only getting hotter and thirstier. I imagine the project has calculated projected evaporative losses and even vaguely recall a news item in which Jerry Brown observed that such losses can't be helped. But the project has certainly benefitted from a lack of scrutiny helped by Governor Newsom's single-minded backing, along with President Trump's, illustrating how alike their motivations and judgements can be.

Please see the satellite image I share as R2G Exec Summary Figure 3. Rangeland Opportunities for Rainfall to Groundwater, p 11, which is also the first image if you scroll down on my Feb. 2022 blog post, Catchment Restoration for Biodiversity, Climate Change Resilience — a post that notes some important info not included in the R2G Exec Summary. I think you'll see how the Sites project overlaps some of those catchment restoration opportunities. And catchment restoration does not need to impact indigenous cultural sites nor steal so-called "surplus surface water" from the freshwater ecosystems that coevolved with the full brunt of California precipitation.

Of course, these comments have little to do with the labor issues before you under Agenda item 12. While catchment restoration necessarily involves jobs, they would not be the type of jobs sought by those particular labor groups, so my comments have little relevance to that concern. I've just felt compelled to advise you at this late date that there is a more benign, more effective, less costly alternative for water storage.

Back to Agenda item 8, but with reference to that satellite image, please note how pretty much all the opportunities highlighted there lie *just upstream of overdrafted groundwater basins*, seen in their agricultural greens in that image; now with their own Groundwater Sustainability Agencies (GSAs) and Plans (GSPs). I note that Groundwater Recharge is among the SB 72 Planning Levers, but to date, DWR and GSA's seem confined in their thinking to moving, so-called "surplus surface waters" around to point recharge locations. Again, this is because they are simply clueless as to how catchments function.

As I have strived to point out, catchment restoration on these rangelands just upstream of the GSAs, offers the most efficient and effective way to recharge their respective aquifers. Restored catchments will function whenever it rains, not just in times of so-called "surplus surface waters". And they'll do it without costly gray infrastructure. Restored infiltration and preferential flow functions will route that recharge directly downstream to the alluvial aquifers from which GSAs are withdrawing their groundwater. They will still need to reduce their overpumping, which I believe has been having an enormous, mostly unrecognized (out of sight, out of mind) impact on the freshwater and estuarine ecosystems of "interconnected surface waters", but at least there is a pathway toward increasing natural recharge that doesn't involve expensive new plumbing projects.

Since I know that at least one of the cited references in the 2021 R2G Exec Summary shows an outdated hyperlink, I'm sharing that here, with an open access link that I know works — "The soil profile as a natural reservoir" (Hursh & Fletcher, 1942). Please find that among the References, next page.

Thank you for your consideration of my comments,

Verna Jigour, PhD

V•Jigour LLC: Rainfall to Groundwater

References

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