



Stanislaus & Tuolumne Rivers Groundwater Basin Association
Groundwater Sustainability Agency
1231 11th Street | Modesto, CA 95354
Email: strgba@mid.org

STRGBA GSA AGENDA

May 11, 2022 (1:30 p.m. – 2:30 p.m.)

Webinar Digital Platform or Phone Meeting

<https://us02web.zoom.us/j/82844864384>

By phone: 1-669-900-9128

Webinar ID: 828 4486 4384

This meeting is being conducted via webinar for all seven member agencies, pursuant to Executive Orders signed by Governor Gavin Newsom related to the ongoing COVID-19 pandemic, including provisions regarding the Brown Act. Members of the public and member agency staff may join the meeting utilizing Zoom's webinar feature if desired, or a phone number as provided in this Agenda. Members of the public will continue to have the opportunity to provide public input via the webinar or phone features. Members of the public may also email public comments by 3:00 p.m. on the day preceding the GSA meeting to: strgba.org. If public comments are timely submitted by email, then those comments will be identified during the public input section of the Agenda or during a specific agenda item if the agenda item is identified in the email. The Brown Act does not require a member of the public to state her or his name; please indicate in your email if you would like your name stated or if you want to remain anonymous. _

PUBLIC PARTICIPATION

The public may participate in this meeting in the two ways described below.

Instructions for Participating in STRGBA GSA & Technical Advisory Meeting via Zoom Webinar or Phone

On your desktop/iPad or tablet/laptop:

1. To join the webinar, click the link published in the Agenda for the current meeting about 5 minutes before webinar begins.
2. Follow the on-screen instructions to install and/or launch the Zoom application.
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1. Call to Order/Welcome and Introductions
(Four agencies needed for a quorum)
2. Business from the Public
Who: Public
Expected Outcome: Interested persons are welcome to introduce any topic within the Agency's jurisdiction. Matters presented under this heading may be discussed but no action will be taken by the Agency at this meeting.
3. Topic: Approve Meeting Minutes for 3/30/22 [[Action Item](#)]
Who: Eric Thorburn, Committee
Expected Outcome: Approval
4. Topic: Remote Teleconferencing Participation [[Action Item](#)]
Who: Gordon Enas, Committee
Expected Outcome: Approval
5. Topic: 2023 Operating Budget
Who: Gordon Enas, Committee
Expected Outcome: Discussion
6. Topic: Well Permitting Review Process
Who: Eric Thorburn, Committee
Expected Outcome: Discussion
7. Topic: GSP Review Comments
Who: Phyllis Stanin, Committee
Expected Outcome: Discussion
8. Next Meeting
June 8, 2022 at 1:30 p.m. via Zoom
9. Items too late for the agenda



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MEETING MINUTES

March 30, 2022 (1:30 p.m. – 2:30 p.m.)

The meeting was called to order at 1:30 p.m.

1. Welcome and Introductions

The following members of the Stanislaus and Tuolumne Rivers Groundwater Basin Association Groundwater Sustainability Agency (STRGBA GSA) attended via Zoom:

Modesto Irrigation District:	Gordon Enas
Oakdale Irrigation District:	Eric Thorburn
City of Modesto:	Miguel Alvarez
City of Oakdale:	Michael Renfrow
City of Riverbank:	Michael Riddell
City of Waterford:	Michael Pitcock
Stanislaus County:	Christy McKinnon

Other Attendees:

Phyllis Stanin, Todd Groundwater	Samantha Wookey, MID
Liz Elliott, Todd Groundwater	John Mauterer
Hilary Reinhard	Ali Taghavi
Louie Brichetto	Bill Hudelson
Andres Diaz	William Fogarty
John Schneider	Dennis Wittchow
Emily Sheldon	John Davids
Jeff Black	Mikayla Tran
Ali Stevens	Jacob DeBoer
Valerie Kincaid	Peter Drekmeier
Allison & Dave Boucher	Debbie Montalbano
Leigh Siracusano	Suzy Powell – Roos
Alyse Briody	



2. Business from the Public

N/A

3. Remote Teleconferencing Participation [Action item]

Alvarez moved, 2nd by Riddell, to approve remote teleconferencing participation through April 30, 2022. Motion carried.

4. Approve 1/31/22 Meeting Minutes [Action item]

Enas moved, 2nd by Riddell, to approve 1/31/22 meeting minutes. Motion carried.

5. 2021 Annual Report [Action item]

The Todd Groundwater and Woodard Curran consultant team gave a presentation on the 2021 Annual Report. The presentation can be found at www.strgba.org. Alvarez moved, 2nd by Pitcock, to approve the submission of the 2021 Annual Report. Motion carried.

- Davids asked if we know the volume of water available between current water levels in our monitoring network and where we set our MT's? Taghavi stated we know how much water is available in each model layer, but the total volume has not been estimated.

6. Budget and Schedule Update

Enas reported that the Todd Groundwater consultant team has expended approximately 96% of budget with one remaining outstanding invoice for cost to prepare the GSP.

7. Stanislaus County Well Permitting Program

Thorburn informed the group about the Stanislaus County Well Permitting Program. The County is asking STRGBA GSA to determine if new wells currently in the permitting process are compliant with the GSP. After much discussion, Thorburn recommended that OID work with legal counsel to develop a formal response letter template which would be provided to the County for well-permit applications. Thorburn will bring back a draft response letter template for review and approval by the GSA at a future meeting.

8. Next meeting

April 13, 2022 at 1:30 p.m. via Zoom

9. Items too late for the agenda



AGENDA REPORT

GSA Meeting Date: May 11, 2022

Subject:	Brown Act Provisions for Remote Teleconferencing Participation in Meetings during a Declared State of Emergency.
Recommended Action:	Resolution approving and confirming a Continuing State of Emergency Arising from the STRGBA GSA's Emergency Declaration During March 2020 (and Subsequent State and County Orders) due to the COVID-19 Pandemic and Further Authorizing Remote Conference Meetings of the STRGBA GSA's Governing Body Pursuant to the Provisions of the Brown Act and Duly Issued Laws and Orders from the State Related to the Pandemic and Operations for Governing Body Meetings.
Background and Discussion:	<p>All meetings of the STRGBA GSA are open and public, as required by the Ralph M. Brown Act (Cal. Gov. Code 54950 – 54963) and related state laws and orders, so that any member of the public may attend either virtually or in-person as the case may be to participate and watch the GSA's governing body conduct GSA business.</p> <p>The Brown Act makes provisions for remote teleconferencing participation in meetings by members of a governing body, without compliance with the requirements of Government Code section 54953(b)(3), subject to the existence of certain conditions, such as when a state of emergency is declared by the Governor pursuant to Government Code section 8625, proclaiming the existence of conditions of disaster or of extreme peril to the safety of persons and property within the state caused by conditions as described in Government Code section 8558. It is further required that state or local officials have imposed or recommended measures to promote social distancing, or, the governing body meeting in person would present imminent risks to the health and safety of attendees.</p> <p>Such conditions now exist in the STRGBA GSA, specifically, a State of Emergency has been proclaimed pursuant to Government Code Section 8625 that the COVID-19 Pandemic has strained the State's healthcare system and workforce and that state and local health departments must use all available preventative measures to combat the spread of COVID-19. As a consequence of the declared emergency, the STRGBA GSA does hereby find that the governing body of the STRGBA GSA shall conduct their meetings without compliance with paragraph (3) of subdivision (b) of Government Code section 54953, as authorized by subdivision (e) of section 54953, and that such governing bodies shall comply with the requirements to provide the public with access to the meetings as prescribed in paragraph (2) of subdivision (e) of section 54953.</p>

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Alternatives, Pros and Cons of Each Alternative:	<p>Pros: Allow GSA meetings to continue to meet while taking all available preventative measures to combat the spread of COVID-19.</p> <p>Cons: Requiring GSA meetings to be held in-person would violate the proclaimed State of Emergency and potentially expose meeting attendees to COVID-19.</p>
Concurrence:	<p>The actions proposed by this resolution have already been adopted by several of the GSA member agencies.</p>
Fiscal Impact:	<p>Since the GSA is currently holding all meetings by remote conferencing, the resolution will create no new or additional fiscal impact.</p>
Recommendation:	<p>Resolution making the following determination:</p> <p>Section 1. Recitals. The Recitals set forth in the attached resolution are true and correct and are incorporated into this Resolution by this reference.</p> <p>Section 2. Proclamation of Local Emergency. The Governing Body hereby proclaims that a local emergency exists throughout the GSA, and that the governing body meeting in person could present imminent risks to the health and safety of attendees due to the prevalence of the COVID-19 Pandemic in Stanislaus County and the State of California, such that the GSA reserves the right to continue virtual meetings and/or conduct in-person meetings consistent with local health guidance or duly issued orders.</p> <p>Section 3. Remote Teleconference Meetings. The Governing Body and its Chairman and designees of the GSA are hereby authorized and directed to take all actions necessary to carry out the intent and purpose of this Resolution including, conducting open and public meetings in accordance with Government Code section 54953(e) and other applicable provisions of the Brown Act.</p> <p>Section 4. Effective Date of Resolution. This Resolution shall take effect immediately upon its adoption and shall be effective until the earlier of (i) June 11, 2022, or (ii) such time the Governing Body adopts a subsequent resolution in accordance with Government Code section 54953(e)(3) to extend the time during which the Governing Body of the GSA may continue to teleconference without compliance with paragraph (3) of subdivision (b) of section 54953.</p>

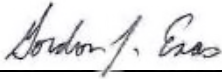
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Attachments:

Supporting documents attached:

Resolution Presentation Other supporting docs None attached

Note: Original contracts and agreements are housed in the GSA Secretary's Office, phone (209) 526-7360.

Presenter

Gordon Enas, P.E.
5/6/2022
Date Signed

GSA Chairman

Eric Thorburn, P.E.
5/6/2022
Date Signed

D R A F T

RESOLUTION NO. 2022-05

RESOLUTION CONFIRMING A CONTINUING STATE OF EMERGENCY ARISING FROM THE STATE OF CALIFORNIA AND STANISLAUS COUNTY ORDERS DUE TO THE COVID-19 PANDEMIC AND FURTHER AUTHORIZING REMOTE CONFERENCE MEETINGS OF THE STRGBA GSA'S GOVERNING BODY PURSUANT TO THE PROVISIONS OF THE BROWN ACT AND DULY ISSUED LAWS AND ORDERS FROM THE STATE RELATED TO THE PANDEMIC AND OPERATIONS FOR GOVERNING BODY MEETINGS.

WHEREAS, the STRGBA GSA is committed to preserving and nurturing public access and participation in meetings of its governing body; and

WHEREAS, all meetings of the STRGBA GSA are open and public, as required by the Ralph M. Brown Act (Cal. Gov. Code 54950 – 54963) and related state laws and orders, so that any member of the public may attend either virtually or in-person as the case may be to participate and watch the GSA's governing body conduct GSA business; and

WHEREAS, the Brown Act, Government Code section 54953(e), makes provisions for remote teleconferencing participation in meetings by members of a legislative body, without compliance with the requirements of Government Code section 54953(b)(3), subject to the existence of certain conditions; and

WHEREAS, a required condition is that a state of emergency is declared by the Governor pursuant to Government Code section 8625, proclaiming the existence of conditions of disaster or of extreme peril to the safety of persons and property within the state caused by conditions as described in Government Code section 8558; and

WHEREAS, a proclamation is made when there is an actual incident, threat of disaster, or extreme peril to the safety of persons and property within the jurisdictions that are within the GSA's boundaries, caused by natural, technological, or human-caused disasters; and

AGENDA REPORT

WHEREAS, it is further required that state or local officials have imposed or recommended measures to promote social distancing, or, the legislative body meeting in person would present imminent risks to the health and safety of attendees; and

WHEREAS, such conditions now exist in the GSA, specifically, a State of Emergency has been proclaimed pursuant to Government Code Section 8625 that the COVID-19 Pandemic has strained the State's healthcare system and workforce and that state and local health departments must use all available preventative measures to combat the spread of COVID-19; and

WHEREAS, as a consequence of the declared emergency, the STRGBA GSA does hereby find that the governing body of the GSA shall conduct their meetings without compliance with paragraph (3) of subdivision (b) of Government Code section 54953, as authorized by subdivision (e) of section 54953, and that such legislative bodies shall comply with the requirements to provide the public with access to the meetings as prescribed in paragraph (2) of subdivision (e) of section 54953; and

WHEREAS, the GSA reserves the option to attend in-person meetings consistent with local health officer directives or to continue a practice of remote meetings that still allow multiple options for public participation.

NOW, THEREFORE, THE GOVERNING BODY OF THE STANISLAUS AND TUOLUMNE RIVERS GROUNDWATER BASIN ASSOCIATION GROUNDWATER SUSTAINABILITY AGENCY DOES HEREBY RESOLVE AS FOLLOWS:

Section 1. Recitals. The Recitals set forth above are true and correct and are incorporated into this Resolution by this reference.

Section 2. Proclamation of Local Emergency. The Governing Body hereby proclaims that a local emergency exists throughout the GSA, and that the governing body meeting in person could present imminent risks to the health and safety of attendees due to the prevalence of the COVID-19 Pandemic in Stanislaus County and the state, such that the GSA reserves the right to continue virtual meetings and/or conduct in-person meetings consistent with local health guidance or duly issued orders.

AGENDA REPORT

Section 3. Remote Teleconference Meetings. The governing body and its Chairman and designees of the GSA are hereby authorized and directed to take all actions necessary to carry out the intent and purpose of this Resolution including, conducting open and public meetings in accordance with Government Code section 54953(e) and other applicable provisions of the Brown Act.

Section 4. Effective Date of Resolution. This Resolution shall take effect immediately upon its adoption and shall be effective until the earlier of (i) June 11, 2022, or (ii) such time the Governing Body adopts a subsequent resolution in accordance with Government Code section 54953(e)(3) to extend the time during which the legislative bodies of the GSA may continue to teleconference without compliance with paragraph (3) of subdivision (b) of section 54953.

2023 OPERATING BUDGET

OPERATING EXPENSES	ESTIMATED	ACTUAL	DIFFERENCE
Administration	10,000.00	0.00	10,000.00
Annual Report	75,000.00	0.00	75,000.00
Grant Proposal Preparation	25,000.00	0.00	25,000.00
Insurance	1,500.00	0.00	1,500.00
Legal and auditing	20,000.00	0.00	20,000.00
Model Update	50,000.00	0.00	50,000.00
Monitoring Wells	4,500.00	0.00	4,500.00
Public Outreach	5,000.00	0.00	5,000.00
Website Maintenance	5,000.00	0.00	5,000.00
Data Management System	10,000.00	0.00	10,000.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
Total Operating Expenses	206,000.00	0.00	206,000.00

GROUNDWATER SUSTAINABILITY AGENCY COMPLIANCE WITH EXECUTIVE ORDER N-7-22

Pursuant to Governor Newsom’s Executive Order N-7-22, the Stanislaus and Tuolumne Rivers Groundwater Basin Association (STRGBA) Groundwater Sustainability Agency (GSA) provides the following acknowledgment, which if executed by a well applicant, would allow the GSA to conclude that the well permit would not be inconsistent with the existing Groundwater Sustainability Plan (GSP).

ACKNOWLEDGMENT

_____ I acknowledge that the Sustainable Groundwater Management Act requires that a GSA manage groundwater in the Modesto Subbasin and the STRGBA GSA is the agency with groundwater management authority over the land subject to Application Permit No. _____.

_____ I acknowledge that the STRGBA GSA has the authority to limit extractions within its jurisdiction including extractions from any well permitted pursuant to Application Permit No. _____.

_____ I acknowledge that a well permit issued by the County does not guarantee the extraction of any specific amount of water now or in the future.

_____ I acknowledge that the STRGBA GSA includes specific groundwater requirements through minimum thresholds and measurable objectives established within the January 2022 Modesto Subbasin Groundwater Sustainability Plan (GSP) which are subject to change in any subsequent or amended GSPs and agree that my groundwater use will comply with these requirements.

_____ I acknowledge the STRGBA GSA cannot guarantee the maintenance of any defined water level or level of water quality in the Modesto Subbasin.

_____ I acknowledge the STRGBA GSA is not responsible for or otherwise liable for any costs, investments or payments related to any groundwater well permitted pursuant to Application Permit No. _____, including pumping fees, extraction limits, costs related to well failure, well deepening, increased maintenance, replacement, or operational costs.

_____ I agree to hold the STRGBA GSA harmless and indemnify the STRGBA GSA for any liability stemming from or related to the County issuing a well permit in response to Application Permit No. _____.

ACKNOWLEDGMENT will be incorporated into the terms and conditions of any well permit issued pursuant to Application Permit No. _____.

Property Owner’s Name

Application Permit No.

Property Owner’s Signature

Date



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, California 95814-4700

April 29, 2022

Paul Gosselin, Deputy Director of Sustainable Groundwater Management
California Department of Water Resources
901 P Street, Room 213
Sacramento, California 94236

Electronic transmittal only

Re: NOAA's National Marine Fisheries Service comments on the Final Groundwater Sustainability Plan for the Modesto subbasin

Dear Deputy Director Gosselin:

NOAA's National Marine Fisheries Service (NMFS) is the federal agency responsible for managing, conserving, and protecting living marine resources in inland, coastal, and offshore waters of the United States. We derive our mandates from numerous statutes, including the Federal Endangered Species Act (ESA). The purpose of the ESA is to conserve threatened and endangered species and their ecosystems.

On January 31, 2022, the West Turlock and East Turlock subbasins Groundwater Sustainability Agencies (hereafter, "GSA") submitted their Final Groundwater Sustainability Plan (GSP) for the Modesto subbasin to the California Department of Water Resources (DWR) as required under California's Sustainable Groundwater Management Act of 2014 (SGMA). In response, DWR opened a 75-day period for public comment for the GSP.

The Modesto subbasin is located mostly within Stanislaus County, and includes areas south of the Stanislaus River, north of the Tuolumne River and east of the San Joaquin River, California. Surface water and groundwater are hydraulically linked in the Modesto subbasin, and this linkage is critically important in creating seasonal habitat for Endangered Species Act (ESA)-listed California Central Valley (CV) steelhead (*Oncorhynchus mykiss*), Central Valley (CV) spring-run Chinook salmon (*O. tshawytscha*), and southern Distinct Population Segment (sDPS) of North American green sturgeon (*Acipenser medirostris*); as well as CV fall-run Chinook salmon (*O. tshawytscha*), an important commercial and recreational sportfish under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Where the groundwater aquifer supplements streamflow, the influx of cold, clean water is critically important for maintaining temperature and flow volume. Pumping water from these aquifer-stream complexes is likely affecting salmon, steelhead, and sturgeon habitat by lowering groundwater levels and interrupting the hyporheic flow between the aquifer and stream. This letter transmits our comments regarding the Modesto GSP. We previously commented on the draft GSP via letter



dated September 29, 2021, but unfortunately some issues remain unaddressed. We have included a copy of our previous comment letter as Attachment 1.

Comments

1. The Final GSP does not adequately address the following requirement for minimum thresholds as defined in the SGMA regulations:

“The relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.” (CCR 23 §354.28(b)(2))

The GSA has not adequately explained how the proposed minimum threshold for streamflow depletion (i.e., low groundwater elevation observed in Fall 2015 at each representative monitoring location) avoids the undesirable result of significant and unreasonable impacts to beneficial uses of surface water. The ability of the proposed sustainable management criteria to avoid impacting surface water beneficial uses, such as salmonid migration, spawning and rearing, are not analyzed. For instance, according to the California Department of Fish and Wildlife, the Stanislaus, Tuolumne, and lower San Joaquin rivers all experienced elevated water temperatures during 2014 and 2015, and 2016.¹ Maximum water temperatures during those years ranged from 25° Celsius (C) to 30° C, which either approach or exceed the lethal limit for salmon and steelhead (Myrick and Cech 2001). The accretion of relatively cold groundwater into streams and rivers can help maintain water temperatures that support aquatic organisms. The GSP does not analyze the impact streamflow depletion and these potential water temperatures may have on beneficial uses of surface water, as well as Chinook salmon and ESA-listed steelhead. Other potential impacts, such as delayed upstream migration by adult Chinook salmon, should be analyzed, and the ability of the minimum threshold to avoid those impacts discussed.

2. As alluded to above, we remain concerned the chosen sustainable management criteria for the streamflow depletion undesirable result are inappropriate for avoiding significant impacts to ESA-listed salmon and sturgeon and their habitat. Basic hydraulic principles dictate that groundwater flow is proportional to the difference between groundwater elevations at different locations along a flow path. Groundwater flow to a stream, or conversely seepage from a stream to the underlying aquifer, is proportional to the difference between surface water elevation and groundwater elevations at locations away from the stream. The minimum threshold creates groundwater conditions consistent with California’s recent historic drought, and are very likely to adversely affect ESA-listed salmonids and sturgeon, and CV fall-run Chinook salmon, as well as their habitat. 2016 was a dry year preceded by three critically dry year in a row, and likely represented the peak of California’s drought of record. Nothing in the GSP analyzes, or attempts to ecologically justify, how groundwater levels consistent with extreme drought conditions will avoid impacting salmonid migration, spawning, and rearing, or maintain suitable cold-water habitat. We

¹ “Statewide Drought Response: Stressor Monitoring – Summary Report 2014-2017.” Copy available at: <https://wildlife.ca.gov/Science-Institute/News/cdfw-documents-statewide-impact-of-recent-drought-on-fish-and-aquatic-species1>

reiterate that based upon documented impacts throughout the state during the 2012-2016 drought, we believe the Modesto subbasin minimum threshold will likely lead to groundwater conditions that adversely affect ESA-listed salmon and sturgeon and degrade their habitat.

Furthermore, per SGMA regulations, minimum thresholds must “represent a point in the basin that, if exceeded, may cause undesirable results.” Based upon the reasoning presented above, we believe the chosen minimum thresholds do not represent a point at which those effects may arise, as is required, but instead represent a likely impact level far past that point.

3. The undesirable result for interconnected streamflow depletion is defined as when 33% (Tuolumne/Stanislaus) or 50% (San Joaquin) of representative monitoring wells for that river exceed the MT in three consecutive Fall monitoring events (Table 6-21). There are two issues with this definition. First, within past assessments of other GSPs², DWR has stated the following with regard to defining undesirable results:

“It is up to GSAs to define, in their GSPs, the *specific* significant and unreasonable effect that would constitute undesirable results and to define the groundwater conditions that would produce those results in their basins. The GSA’s definition needs to include a description of the processes and criteria relied upon to define undesirable results and *must describe the effect of undesirable results on the beneficial uses and users of groundwater.*” (emphasis added)

The GSP does not adequately describe what impact the undesirable result definition for interconnected surface flow depletion may have on beneficial uses or users of groundwater, specifically ESA-listed salmonids and sturgeon, and CV fall-run Chinook salmon. Furthermore, regarding the streamflow depletion undesirable result, the GSP does not define *specific* significant and unreasonable *effects* that would constitute the undesirable result, but instead reiterates the qualitative general definition proved by SGMA regulations (*i.e.*, significant and unreasonable adverse impacts on the beneficial uses of surface water caused by groundwater extractions). This definition does not describe specific *effects* that inform the undesirable result, such as how migration, spawning or rearing beneficial uses may change due to proposed groundwater management. Aquatic organisms persist or perish based upon the impacts to aquatic habitat occurring at a moment in time. In essence, the current definition (*i.e.*, requiring three successive years of minimum threshold exceedance) would allow severe impacts to surface water beneficial uses and ESA-listed species during one year, but an undesirable result would not arise and be addressed unless a second and third year of impacts followed the first. Requiring three consecutive years of potentially lethal conditions (see comment #1) makes little ecological sense when trying to monitor and address impacts to surface water beneficial uses and groundwater dependent ecosystems caused by groundwater pumping.

4. GSPs must describe and consider impacts to GDEs (Water Code § 10727.4(1); see also 23 CCR § 354.16(g)). The GSP fails this requirement with regard to GDEs where groundwater accretion supports salmonid and sturgeon migration, rearing and spawning within the

² Paso Robles GSP assessment, copy available at: <https://sgma.water.ca.gov/portal/gsp/assessments/35>

waterways overlying the subbasin. The GSP includes an analysis of GDE locations in Section 4.3.8, but only focuses on riparian habitat and makes no mention of aquatic GDEs within rivers and streams. GDE impact analysis appears to include nothing more than noting under each undesirable result discussion that GDEs are improved by GSP implementation (e.g., Section 6.4.2.4: GDEs “will benefit from management of groundwater levels to the selected MTs). The GSP does acknowledge that disconnecting the currently interconnected surface water from groundwater would be an undesirable result (page 6-62), but this appears to fall well short of adequately describing and considering impacts to terrestrial, aquatic, and riparian GDEs.

5. When developing sustainable management criteria, and projects and management actions, the GSP appears to be missing adequate analysis and consideration of public trust resources, as required by the Public Trust Doctrine. A recent California Court of Appeal decision³ held that the public trust doctrine must be considered—and public trust resources protected whenever feasible—in any decision governing groundwater withdrawals hydrologically connected to public trust surface waters. As noted above, ESA-listed salmonids and sturgeon, as well as CV fall-run Chinook salmon, inhabit the navigable rivers overlying the Modesto subbasin, and should clearly be considered a public trust resource. Moreover, many of these streams and rivers clearly meet the definition of public trust surface waters.⁴ We reiterate our view that streamflow conditions associated with the chosen sustainability criteria appear likely to impair salmon and sturgeon migration, rearing, and spawning habitat, and thus harm public trust resources. The GSP does not conduct a public trust analysis, nor does it even discuss what public trust resources are applicable to the subbasin or how trust resources may be impacted by the chosen sustainable management criteria. Likewise, no weighing of public trust benefits or impacts occurs within the GSP. Finally, the GSP fails to adequately consider and evaluate alternative measures that would likely protect ecological public trust resources, such as the feasibility of adopting more conservative sustainable management criteria that will avoid harming CCV steelhead, sDPS green sturgeon, CV spring-run Chinook salmon, and CV fall-run Chinook salmon, and their habitat.

Essential Fish Habitat

NMFS is the lead federal agency responsible for the stewardship of the nation's offshore living marine resources and their habitats, and implements the ESA and the MSA to fulfill its mission of promoting healthy ecosystems. Federally-managed living marine resources provide an important source of food and recreation for the nation, as well as thousands of jobs and a traditional way of life for many coastal communities. For the purposes of the MSA, EFH means "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity", and includes the associated physical, chemical, and biological properties that are used by fish (50 CFR 600.10).

EFH has been designated within the GSP area by the Pacific Fishery Management Council (PFMC) for the Pacific Coast Salmon Federal Fishery Management Plan⁵. Waterways overlying the Modesto subbasin contain EFH for the Pacific Coast Salmon FMP. Given the high

³ Environmental Law Foundation v. State Water Resources Control Board (2018) 26 Cal.App.5th 844

⁴ The public trust applies to navigable water bodies, as well as non-navigable water bodies where the harm to such water bodies manifests itself downstream to a navigable water body. See ELF v. SWRCB (2018)

⁵ Publicly available here: <https://www.pcouncil.org/fishery-management-plan-and-amendments-3/>

likelihood that managing groundwater elevations at the low levels experienced during the state's recent drought will continue to negatively affect listed species viability and generally degrade the greater ecosystem (see comments #1 and #2 above). Implementing these conservation recommendations would minimize the adverse and unreasonable effects to EFH and fulfill the obligations under Section 305(b) of the MSA.

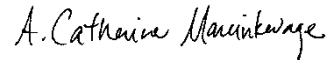
1. The GSP should be revised to incorporate more conservative sustainability management criteria for the streamflow depletion undesirable result to avoid likely adversely affecting Pacific Coast Salmon and their designated EFH within the Modesto subbasin. This recommendation is especially critical given the admitted lack of appropriate data and analysis throughout the subbasin concerning streamflow depletion impacts on salmonid populations and their habitat.

This recommendation fulfills our obligation to provide EFH conservation recommendations to the State as required by MSA Section 305(b)(4)(A). Please let us know how we can assist DWR in addressing this issue.

Conclusion

Given the aforementioned issues outlined above, we recommend DWR find the South American subbasin GSP insufficient at this time until those issue are addressed. Please direct questions regarding this letter to Jon Ambrose at Jonathan.Ambrose@noaa.gov or 916-930-3717.

Sincerely,



Cathy Marcinkevage
Assistant Regional Administrator
California Central Valley Office

Enclosure:

Attachment 1- NOAA's National Marine Fisheries Service comments on the Draft Groundwater Sustainability Plan for the Modesto subbasin, September 29, 2021.

cc: To the File ARN 151422-WCR2021-SA00121

Angela Murvine, CDFW Statewide SGMA Coordinator (Angela.Murvine@wildlife.ca.gov)

Bridget Gibbons, CDFW Central Valley SGMA biologist
(Bridget.Gibbons@wildlife.ca.gov)

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Literature Cited

Myrick, C. A., & Cech, J. J. 2001. Temperature effects on Chinook salmon and steelhead: a review focusing on California's Central Valley populations. Bay-Delta Modeling Forum. Copy available at: <http://www.cwemf.org/Pubs/TempReview.pdf>

ATTACHMENT



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, California 95814-4700

September 29, 2021

John Davids, Assistant General Manager
Stanislaus and Tuolumne Rivers Groundwater Basin Association GSA
1231 11th Street
Modesto, California 95354

Electronic transmittal only

Re: NOAA's National Marine Fisheries Service Comments on the Developing Groundwater Sustainability Plan for the Modesto Subbasin

Dear Mr. Davids:

NOAA's National Marine Fisheries Service (NMFS) is the federal agency responsible for managing, conserving, and protecting living marine resources in inland, coastal, and offshore waters of the United States. We derive our mandates from numerous statutes, including the Federal Endangered Species Act (ESA) and the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The purpose of the ESA is to conserve threatened and endangered species and their ecosystems.

The Modesto subbasin Groundwater Sustainability Agency (hereafter, "GSA") is currently crafting their draft "Chapter 3: Sustainable Management Criteria" for the Modesto Subbasin Groundwater Sustainability Plan (GSP). The California Department of Water Resources (DWR) has designated the Modesto subbasin a "high" priority for groundwater management, necessitating the development of a GSP by January 2022, as required under California's Sustainable Groundwater Management Act of 2014 (SGMA). Several waterways that overlie portions of the Modesto subbasin support federally threatened California Central Valley (CCV) steelhead (*Oncorhynchus mykiss*) and threatened Central Valley (CV) spring-run Chinook salmon (*O. tshawytscha*). In addition, the Modesto subbasin is designated as Essential Fish Habitat (EFH) for Pacific Coast Chinook salmon, including CV fall-run Chinook salmon (*O. tshawytscha*), which are managed under the MSA. This letter transmits NMFS' comments and suggestions, formed largely from our review of other Central Valley draft GSPs, for GSA consideration when crafting sustainable management criteria for the streamflow depletion undesirable result.

Surface water and groundwater are hydrologically linked in the Modesto subbasin, and this linkage is critically important in creating seasonal habitat for Chinook salmon and steelhead. Where the groundwater aquifer supplements streamflow, the influx of cold, clean water is critically important for maintaining temperature and flow volume. Pumping water from these aquifer-stream complexes has the potential to affect salmon and steelhead habitat by lowering groundwater levels and interrupting the hyporheic flow between the aquifer and stream. NMFS is



concerned that groundwater extraction in the Modesto subbasin is currently impacting ESA-listed salmonid instream habitat, including EFH, and recommends the draft GSP adequately address and minimize these impacts.

Comments

Avoiding Undesirable Results: The requirement for minimum thresholds as spelled out in the SGMA regulations is as follows:

“The relationship between the minimum thresholds for each sustainability indicator, including an explanation of how the Agency has determined that basin conditions at each minimum threshold will avoid undesirable results for each of the sustainability indicators.” (CCR 23 §354.28(b)(2))

According to DWR (2021), “it is up to GSAs to define in their GSPs the specific significant and unreasonable effects that would constitute undesirable results and to define the groundwater conditions that would produce those results in their basins.” The GSA should qualitatively describe what conditions within the subbasin would constitute an undesirable result with regard to streamflow depletion, ensuring that the description accounts for impacts to instream habitat that support ESA-listed salmon and steelhead. If data that would inform potential streamflow depletion impacts is lacking, NMFS recommends the final GSP follow guidance from California Department of Fish and Wildlife (2019) and develop conservative streamflow depletion thresholds as a cautionary principle until the surface flow/groundwater dynamic in the Modesto subbasin is better studied and understood.

Using Groundwater Elevations as a Proxy for Streamflow Depletion: If sustainable management criteria are proposed using groundwater elevations as thresholds, the GSA should provide an explanation, with supporting evidence, for why using groundwater level as a minimum threshold is a reasonable proxy for interconnected surface water depletion, as well as why those levels are sufficient to avoid streamflow depletion that significantly impacts surface water beneficial uses.

Basing Sustainable Management Criteria on Historical Drought Conditions: Using pre-SGMA groundwater elevations to inform or set streamflow depletion minimum thresholds and measurable objectives is likely inappropriate for avoiding significant impacts to ESA-listed salmonids and their habitat. Basic hydraulic principles dictate that groundwater flow is proportional to the difference between groundwater elevations at different locations along a flow path. Using this basic principle, groundwater flow to a stream or, conversely, seepage from a stream to the underlying aquifer is proportional to the difference between water elevation in the stream and groundwater elevations at locations away from the stream. Basing sustainable management criteria upon groundwater elevations that occurred during California’s recent historical drought will likely create historically high streamflow depletion rates, resulting in instream conditions that negatively affect ESA-listed salmonids and their critical habitat, including EFH.

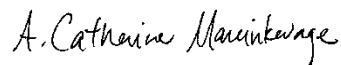
We recommend the GSA design and implement studies that better inform appropriate minimum thresholds and measurable objectives for streamflow depletion during the first year of GSP implementation. The sustainable management criteria that result must avoid significant and

unreasonable impacts to identified beneficial uses of surface water, which for the Stanislaus and Tuolumne rivers include cold freshwater habitat; migration of aquatic organisms; and spawning, reproduction, and/or early development¹. In the interim before adequate data is acquired, we again suggest the GSA follow guidance by the California Department of Fish and Wildlife (2019) that recommends conservative sustainability management criteria be established to ensure groundwater dependent ecosystem protection.

NMFS recommendation for future Projects and Management Actions: We suspect that groundwater recharge projects are likely to be an important action implemented as part of the effort to achieve groundwater sustainability in the Modesto subbasin. NMFS encourages the GSA to consider implementing recharge projects that facilitate floodplain inundation while offering multiple benefits, including downstream flood attenuation, groundwater recharge, and ecosystem restoration. Managed floodplain inundation can recharge floodplain aquifers, which in turn slowly release stored water back to the stream during summer months. These projects also reconnect the stream channel with floodplain habitat, which can benefit juvenile salmon and steelhead by creating off-channel habitat characterized by slow water velocities, ample cover in the form of submerged vegetation, and high food availability. As an added bonus, these types of multi-benefit projects likely have more diverse grant funding streams that can lower their cost as compared to traditional off-channel recharge projects. NMFS stands ready to work with any GSA interested in designing and implementing floodplain recharge projects.

Please direct questions regarding this letter to Amanda Cranford, of my staff, at Amanda.Cranford@noaa.gov or (916) 930-3706.

Sincerely,



Cathy Marcinkevage
Assistant Regional Administrator
California Central Valley Office

References

California Department of Fish and Wildlife. 2019. Fish & Wildlife Groundwater Planning Considerations. California Department of Fish and Wildlife, Groundwater Program. June 2019. 28 pp. Available at: <https://cawaterlibrary.net/document/fish-wildlife-groundwater-planning-considerations/>

¹ Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. Copy at https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf

California Department of Water Resources. 2021. Letter from Craig Altare (DWR) to Taylor Blakslee (Cuyama Basin GSA), re. Cuyama Valley - 2020 Groundwater Sustainability Plan. Available at: <https://sgma.water.ca.gov/portal/gsp/assessments/32>

Cc: To the File ARN 151422-WCR2021-SA00121

Electronic copy only:

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CENTRAL VALLEY FLOOD PROTECTION BOARD

3310 El Camino Ave., Ste. 170
SACRAMENTO, CA 95821
(916) 574-0609 FAX: (916) 574-0682



April 29, 2022

Paul Gosselin, Deputy Director
Statewide Groundwater Management
California Department of Water Resources
1416 9th Street
Sacramento, CA 95814

Eric Thorburn, Plan Manager
Oakdale Irrigation District
1205 East F Street
Oakdale, CA 95361

Subject: Comments on Modesto Subbasin Groundwater Sustainability Plan

Dear Mr. Gosselin and Mr. Thorburn,

Thank you for the opportunity to comment on the Modesto Subbasin Groundwater Sustainability Plan (GSP), which is a joint document prepared by two Groundwater Sustainability Agencies (GSAs).¹ The GSP describes how the GSAs will reach long term groundwater sustainability by outlining the need to reduce overdraft conditions and by identifying projects that may replace or supplement groundwater supplies to meet current and future water demands.

The Central Valley Flood Protection Board (Board) is the State's regulatory agency responsible for ensuring appropriate standards are met for the construction, maintenance, and operation of the flood control system that protects life, property, and habitat in California's Central Valley. The Board serves as the State coordinator between the local flood management agencies, and the federal government, with the goal of providing the highest level of flood protection possible to California's Central Valley.

Encroachment Permit

As required by California Code of Regulations, Title 23, Division 1 (Title 23), Section 6, approval by the Board is required for all proposed work or uses, including the alteration of levees, within any area for which there is an Adopted Plan of Flood Control within the Board's jurisdiction. In addition, Board approval is required for all proposed encroachments within a floodway, on adjacent levees, and within any Regulated Stream identified in Title 23, Table 8.1.

¹ The Modesto Subbasin GSP was prepared by the following GSAs: Stanislaus and Tuolumne Rivers Groundwater Basin Association GSA and County of Tuolumne GSA

Modesto Subbasin GSP Comments

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Specifically, Board jurisdiction includes the levee section, the waterward area between project levees, a minimum 10-foot-wide strip adjacent to the landward levee toe, the area within 30 feet from the top of bank(s) of Regulated Streams, and inside Board's Designated Floodways. Activities outside of these limits which could adversely affect Federal-State flood control facilities, as determined by Board staff, are also under Board's jurisdiction. Permits may also be required for existing unpermitted encroachments or where it is necessary to establish the conditions normally imposed by permitting, including where responsibility for the encroachment has not been clearly established or ownership or uses have been changed.

Some of the proposed projects identified in the GSP may be within the Board's jurisdiction, thereby requiring Board approval. These projects include, but are not limited to, the Tuolumne River Flood Mitigation and Direct Recharge Project, Dry Creek Flood Mitigation and Direct Recharge Project, Stanislaus River Flood Mitigation and Direct Recharge Project, and the MID Flood Managed Aquifer Recharge Project. Please contact Board staff if you would like to schedule a pre-application meeting to discuss any of the projects in detail and/or to determine the documentation required to process an encroachment permit.

Federal permits, including U.S. Army Corps of Engineers (USACE) Section 404 and Section 10 regulatory permits and Section 408 Permission, in conjunction with a Board permit, may be required for the proposed projects. In addition to federal permits, state and local agency permits, certifications, or approvals may also be required. State approvals may include, but are not limited to, California Department of Fish and Wildlife's Lake and Stream Alteration Agreement and Regional Water Quality Control Board's Section 401 Water Quality Certification. The project proponent must obtain these authorizations prior to the implementation of a proposed project.

Subsidence Impacts to Critical Infrastructure

The Board is interested in how the GSP is addressing the sustainability indicators, specifically subsidence, which potentially affects the integrity, functionality, and maintenance costs of Federal-State flood control facilities that are regulated by the Board. The Federal-State flood control facilities are considered critical infrastructure by the State and may only be modified through approval by the Board and USACE.

The State Plan of Flood Control (SPFC) facilities located within the plan area include portions of the Lower San Joaquin River and Tributaries Project (LSJRTP). The facilities of the LSJRTP located within the plan area include the San Joaquin River, Tuolumne River, and Stanislaus River. These facilities are operated and maintained in accordance with State Operation and Maintenance Manuals (O&M Manuals) that are available upon request. The O&M Manuals provide the minimum freeboard and the design profile that have been established for these facilities. Any reduction in the freeboard or change to design profile as a result of subsidence may lead to increased flood risk and damage to Federal-State flood control facilities.

Modesto Subbasin GSP Comments

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Board staff has reviewed the O&M Manuals for the watercourses identified above to determine the freeboard and design flow capacity. It is imperative to ensure that subsidence that is occurring within the planning area does not impact the levee design profiles.

The right bank levee of the San Joaquin River, between the mouths of the Tuolumne and Stanislaus Rivers, and left bank levee along the Stanislaus River from high ground at Kiernan Avenue to the junction of the Stanislaus and San Joaquin Rivers, have a freeboard of at least 3 feet with the following design flows: ²

- 15,000 cubic feet per second (cfs) for the Tuolumne River,
- 46,000 cfs for the San Joaquin River,
- and 12,000 cfs for the Stanislaus River.

The GSP notes that subsidence within the planning area is not a significant issue. Action will be required if the stability changes and subsidence begins to affect SPFC facilities. It is unlawful for any person or public agency to interfere with, obstruct the performance, maintenance, or operation of, or otherwise take actions that may adversely affect SPFC facilities, designated floodways, or streams that are regulated by the Board (Wat. Code Sec. 8700). Any reduction in freeboard or activities affecting the integrity, functionality or maintenance of Federal-State flood control works is considered significant, must be avoided and are subject to enforcement by the Board.

Closing

The Board recognizes the importance of groundwater sustainability in California and commends the GSAs on their effort in planning for a more resilient future. However, the potential risks to public safety, including increased flood risks, need to be considered when developing proposed projects that seek to mitigate for unsustainable groundwater extraction. The Board seeks to establish a collaborative approach with GSAs to better fulfill our regulatory responsibilities in the new paradigm of the Sustainable Groundwater Management Act. Board staff is available to discuss any project(s) proposed under the GSP as it relates to flood control works.

If you have any questions regarding these comments, please contact Ruth Darling at (916) 574-1417, or via email at Ruth.Darling@cvflood.ca.gov.

Sincerely,



Ruth Darling, Program Manager
Flood Planning and Programs Branch

² Supplement to Standard O&M Manual LSJRTP No. 4 East Levee of San Joaquin River within Reclamation District No. 2031

Modesto Subbasin GSP Comments
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ec: Eric Thorburn, Plan Manager
ethorburn@oakdaleirrigation.com

Paul Gosselin, Deputy Director
Paul.Gosselin@water.ca.gov

Portal Submission: <https://sgma.water.ca.gov/portal/gsp/comments/85>



April 30, 2022

Paul Gosselin
Deputy Director, Sustainable Groundwater Management Office
California Department of Water Resources
Sacramento, California
Submitted via SGMA GSP Portal

Re: Comments on the Modesto Groundwater Sustainability Plan

Dear Deputy Director Gosselin,

On behalf of the above-listed organizations, we appreciate the opportunity to comment on the Groundwater Sustainability Plan (GSP) for the Modesto Basin. Our organizations are deeply engaged in and committed to the successful implementation of the Sustainable Groundwater Management Act (SGMA) because we understand that groundwater is critical for the resilience of California's water portfolio, particularly in light of climate change. Our review focuses on how well drinking water users, disadvantaged communities, tribes, environment, stakeholder involvement, and climate change were addressed in the GSP.¹ Collectively, these issues are true indicators of sustainability. Because California's water and economy are interconnected, the sustainable management of each basin is of interest to both local communities and the state as a whole.

Under the requirements of SGMA, Groundwater Sustainability Agencies (GSAs) must consider the interests of all beneficial uses and users of groundwater, including domestic well owners, environmental users, surface water users, state and federal government, California Native American tribes, and

¹ Our organizations are non-tribal NGOs that are providing a review of the identification of federally and state recognized tribes (Data source: SGMA Data viewer) or other tribal interests identified within the GSP. We recognize that there are likely tribal interests that we are not able to detect through mapped lands and stated interests in the GSP. The lack of detection of tribal interests in our analysis should not be taken as evidence for a lack of tribal interests in a basin, but rather that our method could not identify tribal interests. We recommended during our review of draft GSPs that the GSA utilize the DWR's "Engagement with Tribal Governments" Guidance Document to comprehensively address these important beneficial users in their GSP.

disadvantaged communities (DACs).^{2,3} As stakeholders, we reviewed all the draft and final versions of the 2022 GSPs. We appreciate that some basins have consulted us directly via focus groups, workshops, and working groups. Recognizing that GSPs are complicated and resource intensive to develop, we provided technical and policy relevant feedback on each of the 2022 draft GSPs directly to each GSA with the goal of supporting the improvement of GSPs prior to the submission of the final GSP to the California Department of Water Resources (DWR).

Our organizations evaluated the GSPs based on the following nine criteria:

1. Stakeholder engagement
2. Identification of DACs, domestic wells, and tribes
3. Identification of interconnected surface waters (ISWs)
4. Identification of groundwater dependent ecosystems (GDEs)
5. Incorporation of climate change in the water budget
6. Inclusion of ecosystems in the water budget
7. Consideration of impacts to DACs, drinking water users, and environmental users in the sustainable management criteria (SMC)
8. Identification and reconciliation of data gaps
9. Identification of potential impacts to beneficial users in the Projects and Management Actions

Our reviews did not assess the quality of the data provided in the GSP, but analyzed whether data were provided, what data sources were cited, how information about beneficial users of groundwater were used to develop the plan, and whether or not the GSP included plans to reconcile existing data gaps. In our review of the final GSPs, we have specifically looked to see whether the GSA responded to our comments on the draft GSP and whether corresponding edits were made in the final plan.⁴

Based on our evaluation, we found this plan to be **incomplete**, meaning that we found gaps in how beneficial users were addressed within our nine evaluation criteria. Based on this, we recommend that this plan be found incomplete and the GSA be given up to 180 days to address the missing components.

In general, we found the plan to have deficiencies in the following areas:

- Environmental stakeholder engagement during the GSP development process
- Identification of drinking water wells
- Identification of GDEs
- Identification of ISWs
- Inclusion of managed wetlands in the water budget
- Consideration of DACs, drinking water users, and environmental users during the establishment of the sustainable management criteria
- Lack of a drinking water well impact mitigation program
- Representative monitoring well locations relative to key beneficial users

Our specific comments related to the GSP in the Modesto Basin along with detailed recommendations are provided in **Attachment A**. Please refer to the enclosed list of attachments for additional technical recommendations:

Attachment A	GSP Specific Comments
Attachment B	Freshwater species located in the basin
Attachment C	Maps of representative monitoring sites in relation to key beneficial users

² “The groundwater sustainability agency shall consider the interests of all beneficial uses and users of groundwater” [Water Code 10723.2]

³ “When evaluating whether a Plan is likely to achieve the sustainability goal for the basin, the Department shall consider the following: [...] (4) Whether the interests of the beneficial uses and users of groundwater in the basin, and the land uses and property interests potentially affected by the use of groundwater in the basin, have been considered.” [23 CCR § 355.4(b)(4)]

⁴ “When evaluating whether a Plan is likely to achieve the sustainability goal for the basin, the Department shall consider the following: [...] (10) Whether the Agency has adequately responded to comments that raise credible technical or policy issues with the Plan.” [23 CCR § 355.4(b)(10)]

The success of SGMA - the sustainable management of groundwater for current and future social, economic, and environmental benefits - depends on the inclusion of *all* beneficial users in the development and implementation of GSPs. The degree to which key beneficial users are included in GSPs is a critical indicator of whether a plan is indeed on the path to sustainability. Sustainably managing our groundwater resources is critical to the long-term resilience of California's communities, economy, and environment.

We appreciate the opportunity to comment and are available to respond to any questions you might have.

Best Regards,



Ngodoo Atume
Water Policy Analyst
Clean Water Action/Clean Water Fund



J. Pablo Ortiz-Partida, Ph.D.
Bilingual Senior Climate and Water Scientist
Union of Concerned Scientists



Samantha Arthur
Working Lands Program Director
Audubon California



Roger Dickinson
Policy Director
CivicWell (formerly Local Government
Commission)



E.J. Remson
Senior Project Director, California Water Program
The Nature Conservancy



Melissa M. Rohde
Groundwater Scientist
The Nature Conservancy

Attachment A

Specific Comments on the Modesto Basin Final Groundwater Sustainability Plan

This attachment contains our findings for nine criteria used for the evaluation of the basin's draft and final GSP. Here, each of the nine criteria are separated into separate sections and contain a short description of our evaluation criteria and observations.

1. Stakeholder engagement
2. Identification of DACs, domestic wells, and tribes
3. Identification of interconnected surface waters (ISWs)
4. Identification of groundwater dependent ecosystems (GDEs)
5. Incorporation of climate change in the water budget
6. Inclusion of ecosystems in the water budget
7. Consideration of impacts to DACs, drinking water users, and environmental users in the sustainable management criteria (SMC)
8. Identification and reconciliation of data gaps
9. Identification of potential impacts to beneficial users in the Project and Management Actions

A table containing the original evaluation questions for each of the nine criteria are also included under the corresponding section. Within the table, there are a range of three possible answers based on how well the GSP satisfactorily answered the question. In the last column to the right of the table, we also indicate whether or not we saw improvements from the draft GSP for the corresponding question in the final GSP.

1. Stakeholder engagement

The SGMA statute requires that the GSP Notice and Communication chapter identify how stakeholders were actively engaged in the SGMA process.⁵ Stakeholder engagement is critical for the GSAs to fully understand the specific interests and water demands of all beneficial users, and to support the identification and consideration of beneficial users in the development of sustainable management criteria and selection of projects and management actions. To evaluate this, we used the International Association of Public Participation (IAP2) spectrum of public participation referenced in DWR’s “Stakeholder Communication and Engagement” guidance document.⁶ To differentiate between engagement processes for various stakeholders, we considered participation activities that fell under the inform, consult, involve, collaborate, or empower categories. A “Yes” score was given to plans where GSAs proactively identified and targeted outreach to stakeholders to invite stakeholder perspectives into the GSP development process, such as through working groups, advisory committees and GSA board seats. While a “Somewhat” score was given to plans where GSAs had public meetings, email notifications list and public comment process. A “No” score was given to plans where the GSAs failed to identify and engage stakeholders.

However, it is important to note here that it is nearly impossible through reading the plans to decipher whether stakeholder voices are being heard and empowered via these processes. To assess actual engagement, local stakeholders would need to be directly consulted to share their feedback, which was not possible for us to assess during our evaluation of the 2022 GSPs. The expectation is that robust stakeholder engagement includes active and targeted outreach to ensure that stakeholder concerns are consistently understood and stakeholder feedback is incorporated in the decision making process. Because our evaluation of stakeholder engagement across the 2022 GSPs is limited to what is presented in the GSP text, it is possible that despite stakeholders being represented on a GSA board or advisory group that stakeholder feedback was not fully considered and incorporated into the GSP. When stakeholders are considered and empowered in the GSP development process, we would expect to see stakeholder interests adequately reflected throughout the plan.

Table 1 provides a list of questions we used to evaluate how stakeholder engagement was documented in the GSP for key stakeholders, such as DACs, tribes, and the environment. The GSP satisfactorily answered three of five relevant questions for this criteria. Recommendations from our Draft GSP comment letter that have not been addressed in the Final GSP are listed below.

Table 1. Questions used to evaluate stakeholder engagement in the GSP.

Does the GSP engage stakeholders?	No	Somewhat	Yes	Draft vs. Final GSP
Does the GSP document how DAC stakeholders were given opportunities to engage in the GSP development process?	Little to no mention or details of engagement	Inform OR consult	Involve, collaborate, OR empower	Draft Sufficient
Does the GSP document how tribal stakeholders were given opportunities to engage in the GSP development process?	Little to no mention or details of engagement	Inform OR consult	Involve, collaborate, OR empower	Not Applicable⁷
Does the GSP document how environmental stakeholders were given opportunities to engage in the GSP development process?	Little to no mention or details of engagement	Inform OR consult	Involve, collaborate, OR empower	No Change

⁵ “A communication section of the Plan shall include a requirement that the GSP identify how it encourages the active involvement of diverse social, cultural, and economic elements of the population within the basin.” [23 CCR §354.10(d)(3)]

⁶ California Department of Water Resources. 2018. Guidance Document for Groundwater Sustainability Plan: Stakeholder Communication and Engagement. Available at: <https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Assistance-and-Engagement/Files/Guidance-Doc-for-GSP---Stakeholder-Communication-and-Engagement.pdf>

⁷ Tribal data according to SGMA Data Viewer tribal lands - <https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#currentconditions>. Non-federally or state recognized tribal interests may exist in the basin.

Does the Stakeholder Communication and Engagement Plan or GSP include outreach to DACs during GSP implementation?	Little to no mention or details of engagement	Inform OR consult	Involve, collaborate, OR empower	Draft Sufficient
Does the Stakeholder Communication and Engagement Plan or GSP include outreach to tribes during GSP implementation?	Little to no mention or details of engagement	Inform OR consult	Involve, collaborate, OR empower	Not Applicable⁷
Does the Stakeholder Communication and Engagement Plan or GSP include outreach to environmental stakeholders during GSP implementation?	Little to no mention or details of engagement	Inform OR consult	Involve, collaborate, OR empower	No Change
Does the GSP include a Stakeholder Communication and Engagement Plan?	Not Included		Included	Draft Sufficient

RECOMMENDATIONS

- In the Communication and Engagement Plan, describe active and targeted outreach to engage all stakeholders throughout the GSP development and implementation phases. Refer to “Collaborating for Success: Stakeholder Engagement for Sustainable Groundwater Management Act Implementation” for specific recommendations on how to actively engage stakeholders during all phases of the GSP process.⁸
- Provide documentation on how stakeholder input was incorporated into the GSP development process.
- Utilize DWR’s tribal engagement guidance to comprehensively identify, involve, and address all tribes and tribal interests that may be present in the basin.⁹

⁸ Collaborating for Success: Stakeholder Engagement for Sustainable Groundwater Management Act Implementation. Available at:

https://static1.squarespace.com/static/5e83c5f78f0db40cb837cfb5/t/5f3ca8c136dbe60157dd5664/1597810892937/S_GMA_Stakeholder_Engagement_White_Paper.pdf

⁹ Engagement with Tribal Governments Guidance Document. Available at:

https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/Guidance-Doc-for-SGM-Engagement-with-Tribal-Govt_av_19.pdf

2. Identification of DACs, domestic wells, and tribes

The consideration of beneficial uses and users in GSP development is contingent upon adequate identification of *all* beneficial users, including DACs, domestic wells, and tribes.^{1,2} Table 2 provides a list of questions we used to evaluate how these beneficial users were identified in the GSP. These elements are critical for the GSA to fully understand the specific interests and water demands of these beneficial users, and to support their consideration in the development of sustainable management criteria and selection of projects and management actions.

In our review of the identification of DACs, domestic wells, and tribes, we found that the GSP did not map the depth of domestic wells (such as minimum well depth, average well depth, or depth range). This information is necessary to understand the distribution of shallow and vulnerable drinking water wells within the basin.

Table 2 shows the GSP satisfactorily answered four of five relevant questions for this criteria. Recommendations from our Draft GSP comment letter that have not been addressed in the Final GSP are listed below.

Table 2. Questions used to evaluate the identification of DACs, domestic wells, and tribes in the GSP.

Does the GSP identify DACs, domestic wells, and tribes?	No	Somewhat	Yes	Draft vs. Final GSP
Does the GSP identify each DAC by name and location on a map?	Neither mapped NOR identified by name in text	Mapped OR identified by name in text	Mapped AND identified by name in text	Draft Sufficient
Are tribal lands identified and mapped in the basin?	Neither mapped NOR identified in text	Mapped OR identified in text	Mapped AND identified in text	Not Applicable⁷
Does the GSP describe the size of the population in each DAC?	Not included	Vaguely mentioned or mapped	Explicitly mentioned or mapped	Final Improved
Does the GSP map minimum well depth, or depth range of domestic wells?	Neither mapped NOR depth ranges included	Map OR depth ranges included	Map AND depth ranges included	Final Improved
Does the GSP map the density of domestic wells in the basin?	Not included		Included	Draft Sufficient
Does the GSP identify the water source for DACs?	No mention	Only general reference	Explicit identification	Draft Sufficient

RECOMMENDATIONS

- Include a map showing domestic well locations and average well depth across the basin.

3. Identification of interconnected surface waters

SGMA requires that the GSP identify ISWs in the basin, including estimates of the quantity and timing of depletions.¹⁰ Table 3 provides a list of questions we used to evaluate how well ISWs were identified in the GSP. The complete analysis of ISWs requires mapping of gaining and losing reaches and assessing the temporal variability in stream depletions to account for the inherent variability within California's Mediterranean climate. Since this relies upon seasonal and multiple water years of data, the GSP should discuss the spatial and temporal gaps in data needed to adequately characterize the interaction between groundwater and surface water within the basin. In the absence of data, the GSP should not exclude any segments with data gaps from the ISW map and instead consider and map them explicitly as potential ISWs until data gaps are reconciled. The absence of evidence is not the evidence of absence.

In our review of the identification of interconnected surface waters, we found that the GSP provided the modeling analysis used to assess ISWs in the basin, which was missing from the Draft GSP. The GSP presents model nodes of the surface water as "predominantly gaining," "mixed conditions," or "predominantly losing," and concludes that all surface water in the basin is interconnected. The GSP could be improved by clearly describing the screening depths of wells used in the groundwater modeling analysis, to provide confirmation that the wells are monitoring the shallow principal aquifer.

Table 3 shows the GSP satisfactorily answered two of four relevant questions for this criteria. Recommendations that would improve the Final GSP are listed below.

Table 3. Questions used to evaluate the identification of ISWs in the GSP.

Does the GSP identify interconnected surface water (ISW)?	No	Somewhat	Yes	Draft vs. Final GSP
Are gaining and losing reaches adequately assessed spatially and temporally?	No ISW map	ISW map with single water year data; unclear methods	ISW map with multiple water year data; clear methods	Final Improved
Are the conclusions of ISWs consistent with the assessment?	Vague and contradictory with analysis OR No evidence to support conclusion.	Lacking some detail and evidence	Coherent with analysis and available data	Final Improved
Are all shallow principal aquifers acknowledged in defining ISW?	Not acknowledged	Not explicitly or adequately acknowledged	Acknowledged	Final Improved
Were data gaps identified when mapping ISWs?	Not identified	Vague description	Clear identification	Draft Sufficient
In the case of data gaps and uncertainty, were streams mapped and described as potential ISWs in the GSP?	Not described NOR mapped	Vague description OR no map	Clearly described AND mapped temporarily and spatially	Not Applicable ¹¹

¹⁰ "Each plan shall provide a description of current and historic groundwater conditions in the basin, including data from January 1, 2015, to current conditions, based on the best available information that includes [...] (f) Identification of interconnected surface water systems within the basin and an estimate of the quantity and timing of depletions of those systems, utilizing data available from the Department, as specified in Section 353.2, or the best available information." [23 CCR § 354.16(f)]

¹¹ Not applicable because all stream reaches in the basin are considered to be ISW.

RECOMMENDATIONS

- Describe the monitoring wells used in the modeling analysis, including their screening depths.
- To confirm and illustrate the results of the modeling analysis, overlay the basin's stream reaches on depth-to-groundwater contour maps to illustrate groundwater depths and the groundwater gradient near the stream reaches. Show the location of groundwater wells used in the analysis.

4. Identification of groundwater dependent ecosystems

SGMA requires that GDEs be identified in the GSP.^{12,13} Table 4 provides a list of questions we used to evaluate how these beneficial users were identified in the GSP. These elements are critical for the GSA to fully understand the specific interests and water demands of these beneficial users, and to support their consideration in the development of sustainable management criteria and selection of projects and management actions.

In our review of the identification of GDEs, we found that the GSP mapped GDEs using the Natural Communities Commonly Associated with Groundwater dataset (NC dataset).¹⁴ The GSP used groundwater data from two dates (spring 1998 and fall 2015) to characterize groundwater conditions supporting the basin's GDEs. We recommend using additional groundwater data to determine the range of depth to groundwater around NC dataset polygons and to more completely describe groundwater conditions within the basin's GDEs. Using seasonal groundwater elevation data over multiple water year types is an essential component of identifying GDEs and is necessary to capture the variability in groundwater conditions inherent in California's Mediterranean climate. Furthermore, we found it to be unclear whether GDEs in areas of data gaps were mapped and described as "potential GDEs" in the GSP. The GSP did not provide an inventory of flora and fauna in the basin or identify threatened and endangered species.

Table 4 shows the GSP satisfactorily answered three of eight questions for this criteria. Recommendations from our Draft GSP comment letter that have not been addressed in the Final GSP are listed below.

Table 4. Questions used to evaluate the identification of GDEs in the GSP.

Does the GSP identify groundwater dependent ecosystems (GDEs)?	No	Somewhat	Yes	Draft vs. Final GSP
Is there an inventory, map, or description of fauna (e.g., birds, fish, amphibian) and flora (e.g., plants) species or habitat types in the basin's GDEs? Please indicate in the notes if threatened and endangered species are identified in the GSP.	No description of flora NOR fauna in GDEs	Some details lacking on flora, fauna OR threatened or endangered species	Includes flora, fauna AND threatened or endangered species	No Change
Were GDEs in the basin identified (mapped) and described in the GSP using best available data (e.g., NC dataset, localized VegMap data)?	No GDE map	GDE map provided, but based on unclear or incorrect data/methods	GDE map included with best available data	Final Improved
Was depth-to-groundwater data from the underlying principal aquifer used to verify the NC dataset?	Not incorporated	Incorporated, but unclear spatial or temporal data	Clearly incorporated and described	Final Improved
Did the GSP avoid using any of the following criteria when deciding whether or not to remove NC dataset polygons from the final GDE map: 1) presence of surface water, 2) distance from agricultural fields, 3) shallow principal aquifer was not considered main pumping aquifer, 4) groundwater connection only some percentage of the time, 5) other?	No	Unclear	Yes	Draft Sufficient
Were multiple water year types (e.g., wet, average, dry) of groundwater level data used to characterize groundwater conditions in the GDEs?	No	Unclear	Yes	Final Improved
Were depth-to-groundwater measurements under GDEs corrected for land surface elevations?	No	Unclear	Yes	Final Improved

¹² "Each plan shall provide a description of current and historic groundwater conditions in the basin, including data from January 1, 2015, to current conditions, based on the best available information that includes [... (g)] Identification of GDEs within the basin, utilizing data available from the Department, as specified in Section 353.2, or the best available information." [23 CCR § 354.16(g)]

¹³ Refer to Attachment B for a list of freshwater species located in the basin.

¹⁴ Department of Water Resources. 2018. Natural Communities Commonly Associated with Groundwater dataset (NC Dataset). Available at: <https://qis.water.ca.gov/app/NCDataSetViewer/>.

Were data gaps identified when mapping GDEs?	Data gaps not identified	Data gaps described vaguely	Data gaps described clearly	No Change
In the case of data gaps and uncertainty, were potential GDEs mapped and described in the GSP?	Not mapped NOR described	No map OR vague description	Clearly mapped AND described	No Change

RECOMMENDATIONS

- Use depth-to-groundwater data from multiple seasons and water year types (e.g., wet, dry, average, drought) to determine the range of depth to groundwater around NC dataset polygons. We recommend that a baseline period (10 years from 2005 to 2015) be established to characterize groundwater conditions over multiple water year types. Refer to The Nature Conservancy’s “Identifying GDEs under SGMA: Best Practices for using the NC Dataset” for best practices for using local groundwater data to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer.¹⁵
- If insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons as “Potential GDEs” in the GSP until data gaps are reconciled in the monitoring network.
- Provide a complete inventory, map, or description of fauna (e.g., birds, fish, amphibian) and flora (e.g., plants) species in the basin and note any threatened or endangered species (see Attachment B in this letter for a list of freshwater species located in the Modesto Basin).
- For more information on shallow groundwater conditions in the basin, refer to The Nature Conservancy’s new tool, “SAGE: Shallow Groundwater Estimation Tool”, which uses machine learning and 35 years of satellite data to predict depth to groundwater and determine groundwater level trends for every polygon within the NC Dataset.^{16,17}

¹⁵ The Nature Conservancy’s “Identifying GDEs under SGMA: Best Practices for using the NC Dataset.” Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/TNC_NCdataset_BestPracticesGuide_2019.pdf

¹⁶ Webtool available at: <https://igde-work.earthengine.app/view/sage>

¹⁷ Rohde, M.M., T. Biswas, I.W. Housman, L.S. Campbell, K.R. Klausmeyer, J.K. Howard. 2021. A machine learning approach to predict groundwater levels in California reveals ecosystems at risk. *Frontiers in Earth Science*, doi: 10.3389/feart.2021.784499. Available at: <https://www.frontiersin.org/articles/10.3389/feart.2021.784499/full>

5. Incorporation of climate change in the water budget

The SGMA statute identifies climate change as a significant threat to groundwater resources and one that must be examined and incorporated in the GSPs. The GSP Regulations require integration of climate change into the projected water budget to ensure that projects and management actions sufficiently account for the range of potential climate futures.¹⁸

In our review of climate change in the projected water budget, we found that the GSP did incorporate climate change into the projected water budget using DWR change factors for 2070. However, the GSP did not consider multiple climate scenarios (such as the 2070 wet and 2070 extremely dry climate scenarios) in the projected water budget. The GSP would benefit from clearly and transparently incorporating the extremely wet and dry scenarios provided by DWR into projected water budgets or selecting more appropriate extreme scenarios for the basin. While these extreme scenarios may have a lower likelihood of occurring and their consideration is only suggested by DWR, their consequences could be significant and their inclusion can help identify important vulnerabilities in the basin's approach to groundwater management.

Table 5 shows the GSP satisfactorily answered five of six questions for this criteria. Recommendations from our Draft GSP comment letter that have not been addressed in the Final GSP are listed below.

Table 5. Questions used to evaluate whether the GSP accounted for climate change.

Does the GSP account for climate change in the water budget?	No	Somewhat	Yes	Draft vs. Final GSP
Does the GSP incorporate climate change into the projected water budget using DWR change factors or other source?	No	Unclear	Yes	Draft Sufficient
Does the GSP consider multiple climate scenarios (e.g., the 2070 wet and 2070 extremely dry) scenarios in the projected water budget?	No	Somewhat	Yes	No Change
Does the GSP incorporate climate change into precipitation inputs for the projected water budget?	No	Unclear	Yes	Draft Sufficient
Does the GSP incorporate climate change into evapotranspiration inputs for the projected water budget?	No	Unclear	Yes	Draft Sufficient
Does the GSP incorporate climate change into surface water flow inputs (e.g., imported water, streamflow) for the projected water budget?	No	Unclear	Yes	Draft Sufficient
Does the GSP incorporate climate change into sea level inputs for the projected water budget?	No	Unclear	Yes	Not Applicable
Does the GSP calculate a sustainable yield based on the projected water budget with climate change incorporated?	No		Yes	Draft Sufficient

RECOMMENDATIONS

- Integrate climate change, including extreme climate scenarios, into all elements of the projected water budget to form the basis for development of sustainable management criteria and projects and management actions.

¹⁸ "Each Plan shall rely on the best available information and best available science to quantify the water budget for the basin in order to provide an understanding of historical and projected hydrology, water demand, water supply, land use, population, climate change, sea level rise, groundwater and surface water interaction, and subsurface groundwater flow." [23 CCR §354.18(e)]

6. Inclusion of ecosystems in the water budget

Native vegetation and managed wetlands are water use sectors that are required to be included into the water budget.^{19,20} Based on our review, we found native vegetation was properly included in the historical, current, and projected water budgets. The GSP is not clear about whether managed wetlands exist in the basin. The GSP makes several references to wetlands, and acknowledges that many identified wetlands rely on groundwater, but does not specifically discuss managed wetlands.

Table 6 shows the GSP satisfactorily answered one of two questions for this criteria. Recommendations from our Draft GSP comment letter that have not been addressed in the Final GSP are listed below.

Table 6. Questions used to evaluate whether the GSP accounted for ecosystems in the water budget.

Does the GSP account for ecosystems in the water budget?	No	Somewhat	Yes	Draft vs. Final GSP
Does the GSP include water demands for native vegetation in the historic, current, and projected water budgets?	No	Vague description	Yes	Draft Sufficient
Does the GSP include water demands for managed wetlands in the historic, current, and projected water budgets?	No	Vague description	Yes	No Change

RECOMMENDATIONS

- Discuss and map the presence of managed wetlands in the basin. Quantify and present all water use sector demands in the historical, current, and projected water budgets with individual line items for each water use sector, including managed wetlands.

¹⁹ “‘Water use sector’ refers to categories of water demand based on the general land uses to which the water is applied, including urban, industrial, agricultural, managed wetlands, managed recharge, and native vegetation.” [23 CCR §351(a)]

²⁰ “The water budget shall quantify the following, either through direct measurements or estimates based on data: (3) Outflows from the groundwater system by water use sector, including evapotranspiration, groundwater extraction, groundwater discharge to surface water sources, and subsurface groundwater outflow.” [23 CCR §354.18]

7. Consideration of impacts to DACs, drinking water users, and environmental users in the sustainable management criteria?

The consideration of potential impacts on *all* beneficial users of groundwater in the basin are required when defining undesirable results and establishing minimum thresholds.^{21,22,23} Table 7 provides a list of questions we used to evaluate the consideration of DACs, drinking water users, and environmental users in the sustainable management criteria of the GSP. Adequate consideration of potential impacts on these beneficial users is contingent upon adequate identification and engagement of the appropriate stakeholders, and is essential for ensuring the GSP integrates existing state policies on the Human Right to Water and the Public Trust Doctrine.²⁴

SGMA requires that the sustainable management criteria be consistent with the Human Right to Water policy and avoid significant and unreasonable impacts on drinking water users. The GSP should describe direct and indirect impacts on DACs and drinking water users when defining undesirable results and minimum thresholds for chronic lowering of groundwater levels and degraded water quality.

Disadvantaged Communities (DACs)

The GSP does not provide an analysis of the direct or indirect impacts on DACs when defining undesirable results. In addition, the GSP does not provide an analysis of the impacts of the proposed minimum thresholds nor measurable objectives for the groundwater elevation nor water quality sustainability indicators. This is particularly concerning given the absence of a drinking water well mitigation plan in the GSP.

Drinking Water Users

The GSP provides an analysis of the direct or indirect impacts on drinking water users when defining undesirable results. While the GSP provides an analysis of the impacts of the proposed minimum thresholds for the groundwater elevation and water quality sustainability indicators, it does not provide an analysis of the impacts of the proposed measurable objectives for these sustainability indicators. This is particularly concerning given the absence of a drinking water well mitigation plan in the GSP.

SGMA specifically requires that GSPs include “impacts on groundwater dependent ecosystems” and to assess whether surface water depletions caused by groundwater use are having an adverse impact on beneficial users of surface water and groundwater.^{25,26,27} The GSP should describe direct and indirect impacts on GDEs and instream habitats within ISWs when defining undesirable results and minimum thresholds for chronic lowering of groundwater levels, degraded water quality, and depletion of interconnected surface water.

²¹ “The description of undesirable results shall include [...] potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results.” [23 CCR §354.26(b)(3)]

²² “The description of minimum thresholds shall include [...] how minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.” [23 CCR §354.28(b)(4)]

²³ “The description of minimum thresholds shall include [...] how state, federal, or local standards relate to the relevant sustainability indicator. If the minimum threshold differs from other regulatory standards, the agency shall explain the nature of and the basis for the difference.” [23 CCR §354.28(b)(5)]

²⁴ “The Department shall consider the state policy regarding the human right to water when implementing these regulations.” [23 CCR §350.4(g)]

²⁵ “The minimum threshold for depletions of interconnected surface water shall be the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of the surface water and may lead to undesirable results.” [23 CCR §354.28(c)(6)]

²⁶ “The description of minimum thresholds shall include the following: [...] (4) How minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.” [23 CCR §354.28(b)(4)]

²⁷ Water Code §10727.4(l)

Environmental Users

The GSP does not provide an analysis of the direct or indirect impacts on GDEs and environmental beneficial users of surface water when defining undesirable results. In addition, the GSP does not provide an analysis of the impacts of the proposed minimum thresholds nor measurable objectives for the groundwater elevation, water quality, nor depletion of surface water sustainability indicators.

Table 7 shows the GSP satisfactorily answered four of eleven questions for this criteria. Recommendations from our Draft GSP comment letter that have not been fully addressed in the Final GSP are listed below.

Table 7. Questions used to evaluate the consideration of DACs, drinking water users, and environmental users in the sustainable management criteria of the GSP.

Does the GSP consider impacts to DACs, drinking water users, and GDEs in the sustainable management criteria?	No	Somewhat	Yes	Draft vs. Final GSP
Does the GSP analyze direct or indirect impacts on domestic drinking wells when defining Undesirable Results?	No mention	Mentioned, but not well analyzed	Analyzed and described	Draft Sufficient
Does the GSP analyze direct and indirect impacts on DACs when defining Undesirable Results?	No mention	Mentioned, but not well analyzed	Analyzed and described	No Change
Does the GSP analyze direct and indirect impacts on GDEs when defining Undesirable Results?	No mention	Mentioned, but not well analyzed	Analyzed and described	No Change
Does the GSP evaluate the cumulative or indirect impacts of proposed groundwater elevation and water quality minimum thresholds on drinking water users (e.g., domestic wells, municipal water suppliers)?	No mention	Mentioned, but not well analyzed for all relevant sustainability indicators	Analyzed and described	Draft Sufficient
Does the GSP evaluate the cumulative or indirect impacts of proposed groundwater elevation and water quality minimum thresholds on DACs?	No mention	Mentioned, but not well analyzed for all relevant sustainability indicators	Analyzed and described	No Change
Does the GSP evaluate the cumulative or indirect impacts of proposed minimum thresholds for groundwater elevations and ISW on GDEs or environmental beneficial users of surface water?	No mention	Mentioned, but not well analyzed for all relevant sustainability indicators	Analyzed and described	No Change
Does the GSP establish Water Quality minimum thresholds and measurable objectives for the identified constituents/contaminants identified in the plan area?	No	Only for some constituents of concern	Yes	Draft Sufficient
Are Water Quality minimum thresholds based on or within the Maximum Contaminant levels (MCLs)?	No	Only for some constituents of concern	Yes	Draft Sufficient
Does the GSP consider drinking water users when establishing water quality and groundwater elevation measurable objectives?	No mention	Mentioned, but not well analyzed for all relevant sustainability indicators	Analyzed and described	No Change
Does the GSP consider DACs when establishing water quality and groundwater elevation measurable objectives?	No mention	Mentioned, but not well analyzed for all relevant sustainability indicators	Analyzed and described	No Change
Does the GSP consider GDEs when establishing ISW and groundwater elevation measurable objectives?	No mention	Mentioned, but not well analyzed for all relevant sustainability indicators	Analyzed and described	No Change

RECOMMENDATIONS

- Describe direct and indirect impacts on drinking water users and DACs when describing undesirable results and defining minimum thresholds for chronic lowering of groundwater levels. Include information on the impacts during prolonged periods of below average water years.
- Consider and evaluate the impacts of selected minimum thresholds and measurable objectives on drinking water users and DACs within the basin. Further describe the impact of passing the minimum threshold for these users.
- Consider minimum threshold exceedances during single dry years when defining the groundwater level undesirable result across the basin.
- Describe direct and indirect impacts on drinking water users and DACs when defining undesirable results for degraded water quality.²⁸ For specific guidance on how to consider these users, refer to “Guide to Protecting Water Quality Under the Sustainable Groundwater Management Act.”²⁹
- Evaluate the cumulative or indirect impacts of proposed minimum thresholds for degraded water quality on drinking water users and DACs.
- When establishing SMC for the basin, consider that the SGMA statute [Water Code §10727.4(l)] specifically calls out that GSPs shall include “impacts on groundwater dependent ecosystems.”
- When defining undesirable results for chronic lowering of groundwater levels, provide specifics on what biological responses (e.g., extent of habitat, growth, recruitment rates) would best characterize a significant and unreasonable impact to GDEs. Undesirable results to environmental users occur when ‘significant and unreasonable’ effects on beneficial users are caused by one of the sustainability indicators (i.e., chronic lowering of groundwater levels, degraded water quality, or depletion of interconnected surface water). Thus, potential impacts on environmental beneficial uses and users need to be considered when defining undesirable results in the basin.³⁰ Defining undesirable results is the crucial first step before the minimum thresholds can be determined.³¹
- When defining undesirable results for depletion of interconnected surface water, include a description of potential impacts on instream habitats within ISWs when minimum thresholds in

²⁸ “Degraded Water Quality [...] collect sufficient spatial and temporal data from each applicable principal aquifer to determine groundwater quality trends for water quality indicators, as determined by the Agency, to address known water quality issues.” [23 CCR §354.34(c)(4)]

²⁹ Guide to Protecting Water Quality under the Sustainable Groundwater Management Act
https://d3n8a8pro7vhm.cloudfront.net/communitywatercenter/pages/293/attachments/original/1559328858/Guide_to_Protecting_Drinking_Water_Quality_Under_the_Sustainable_Groundwater_Management_Act.pdf?1559328858

³⁰ “The description of undesirable results shall include [...] potential effects on the beneficial uses and users of groundwater, on land uses and property interests, and other potential effects that may occur or are occurring from undesirable results”. [23 CCR §354.26(b)(3)]

³¹ The description of minimum thresholds shall include [...] how minimum thresholds may affect the interests of beneficial uses and users of groundwater or land uses and property interests.” [23 CCR §354.28(b)(4)]

the basin are reached.³² The GSP should confirm that minimum thresholds for ISWs avoid adverse impacts on environmental beneficial users of interconnected surface waters as these environmental users could be left unprotected by the GSP. These recommendations apply especially to environmental beneficial users that are already protected under pre-existing state or federal law.^{21,33}

- To identify beneficial users in the basin that may be at risk to groundwater level declines, refer to The Nature Conservancy's new tool, "SAGE: Shallow Groundwater Estimation Tool", which uses machine learning and 35 years of satellite data to predict depth to groundwater for each polygon within the NC Dataset.^{34,35}

³² "The minimum threshold for depletions of interconnected surface water shall be the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of the surface water and may lead to undesirable results." [23 CCR §354.28(c)(6)]

³³ Rohde MM, Seapy B, Rogers R, Castañeda X, editors. 2019. Critical Species LookBook: A compendium of California's threatened and endangered species for sustainable groundwater management. The Nature Conservancy, San Francisco, California. Available at:

https://groundwaterresourcehub.org/public/uploads/pdfs/Critical_Species_LookBook_91819.pdf

³⁴ Webtool available at: <https://igde-work.earthengine.app/view/sage>

³⁵ Rohde, M.M., T. Biswas, I.W. Housman, L.S. Campbell, K.R. Klausmeyer, J.K. Howard. 2021. A machine learning approach to predict groundwater levels in California reveals ecosystems at risk. *Frontiers in Earth Science*, doi: 10.3389/feart.2021.784499. Available at: <https://www.frontiersin.org/articles/10.3389/feart.2021.784499/full>

8. Identification and reconciliation of data gaps

Adaptive Management is at the core of SGMA. SGMA also requires that impacts to beneficial uses or users of groundwater be monitored.³⁶ Beneficial users may remain unprotected by the GSP without adequate monitoring. When data gaps are not identified, particularly in shallow aquifers, impacts disproportionately threaten GDEs, aquatic habitats, and shallow domestic well water users. In addition to monitoring wells, biological monitoring is an important component to ensure impacts to GDEs do not occur.¹³ Table 8 provides a list of questions we used to evaluate whether the GSP identified data gaps in the monitoring network and made plans to reconcile them. In many cases, GSPs did not provide adequate mapping to clearly convey whether current and proposed monitoring well locations sufficiently monitored groundwater conditions for key beneficial users. For this reason, we created a set of maps (provided in Attachment C) that we included in the draft GSP comment letters to help us evaluate the questions in Table 8.

In our review, we found that the GSP did not identify and reconcile data gaps for some beneficial users in the basin. Table 8 shows the GSP satisfactorily answered none of the four questions for this criteria. Recommendations from our Draft GSP comment letter that have not been addressed in the Final GSP are listed below.

Table 8. Questions used to evaluate whether the GSP identified data gaps and made plans to reconcile them.

Does the GSP identify and reconcile data gaps?	No	Somewhat	Yes	Draft vs. Final GSP
Do the Representative Monitoring Sites (RMS) in the monitoring network adequately represent water quality conditions around DACs, domestic wells, tribes, and GDEs (in the case of data gaps, evaluate proposed monitoring sites)?	Not present within DAC, domestic well, tribal areas, NOR GDEs.	Not adequately cover DAC, domestic well, tribal areas, OR GDEs.	Adequately distributed (<1 mi) across DAC, domestic well, tribal areas, AND GDEs.	Final Worsened
Do the Representative Monitoring Sites (RMS) in the monitoring network adequately represent shallow groundwater elevations around DACs, domestic wells, tribes, and GDEs (in the case of data gaps, evaluate proposed monitoring sites).	Not present within DAC, domestic well, tribal areas, NOR GDEs.	Not adequately cover DAC, domestic well, tribal areas, OR GDEs.	Adequately distributed (<1 mi) across DAC, domestic well, tribal areas, AND GDEs.	No Change
Does the GSP include a plan to identify and fill shallow monitoring well data gaps around GDEs and ISWs in the monitoring network?	No	Vague description	Yes	No Change
Does the GSP include any plans to incorporate GDE-related biological monitoring into the monitoring network?	No	Vague description	Yes	Final Improved

RECOMMENDATIONS

- Provide maps that overlay current and proposed monitoring well locations with the locations of DACs, domestic wells, and GDEs to clearly identify monitored areas.
- Increase the number of representative monitoring sites (RMSs) in the shallow aquifer across the basin as needed to map ISWs and adequately monitor all groundwater condition indicators across the basin and at appropriate depths for *all* beneficial users. Prioritize proximity to DACs, domestic wells, GDEs, and ISWs when identifying new RMSs.

³⁶ “The monitoring network objectives shall be implemented to accomplish the following: [...] (2) Monitor impacts to the beneficial uses or users of groundwater.” [23 CCR §354.34(b)(2)]

- Ensure groundwater elevation and water quality RMSs are monitoring groundwater conditions spatially and at the correct depth for *all* beneficial users - especially DACs, domestic wells, and GDEs.
- Further describe biological monitoring that can be used to assess the potential for significant and unreasonable impacts to GDEs or ISWs due to groundwater conditions in the basin.
- Ensure the GSP includes specific plans to address data gaps for GDEs and ISWs.
- Prioritize the installation of new wells around beneficial uses most susceptible to groundwater decline by referring to The Nature Conservancy's new tool, "SAGE: Shallow Groundwater Estimation Tool", which uses machine learning and 35 years of satellite data to predict depth to groundwater for each polygon within the NC Dataset.^{37,38}

³⁷ Webtool available at: <https://igde-work.earthengine.app/view/sage>

³⁸ Rohde, M.M., T. Biswas, I.W. Housman, L.S. Campbell, K.R. Klausmeyer, J.K. Howard. 2021. A machine learning approach to predict groundwater levels in California reveals ecosystems at risk. *Frontiers in Earth Science*, doi: 10.3389/feart.2021.784499. Available at: <https://www.frontiersin.org/articles/10.3389/feart.2021.784499/full>

9. Identification of potential impacts to beneficial users in the Project and Management Actions

Project and Management Actions are essential for ensuring the basin stays within or achieves its sustainable yield and avoids undesirable results for *all* beneficial users in the basin. Therefore, it is important that the GSP identifies benefits or impacts of project and management actions to key beneficial users. Table 9 provides a list of questions we used to evaluate whether benefits and potential impacts to beneficial users were identified in the GSP's Project and Management Actions. While not all projects and management actions are applicable to every basin, the GSP should include benefits and evaluate impacts to vulnerable beneficial users in all planned projects and management actions, and include a drinking water well mitigation program to protect drinking water. We assessed whether or not the projects had specific plans (such as a timeline and funding) in place during the GSP planning horizon, or whether it was described as a potential future project.

Table 9 shows the GSP satisfactorily answered three of six questions for this criteria. Recommendations from our Draft GSP comment letter that have not been addressed in the Final GSP are listed below.

Table 9. Questions used to evaluate whether potential impacts to beneficial users were identified in the GSP's Project and Management Actions.

Does the GSP identify potential impacts to beneficial users in the Project and Management Actions?	No	Somewhat	Yes	Draft vs. Final GSP
Does the GSP include any recharge projects with explicit benefits to the environment?	No	Vague description or listed as potential project	Yes	No Change
Does the GSP include any habitat or stream restoration or invasive species removal projects (e.g., to improve water supply in the basin or GDE habitats)?	No	Vague description or listed as potential project	Yes	No Change
Does the GSP identify benefits or impacts of identified projects and management actions to key beneficial users such as GDEs, drinking water users, tribes, DACs?	No	Vague description	Yes	Draft Sufficient
Does the GSP include any recharge projects with explicit benefits to DACs?	No	Vague description or listed as potential project	Yes	Draft Sufficient
Does the GSP include a drinking water well mitigation program to avoid significant and unreasonable loss of drinking water?	No	Vague description or listed as potential project	Yes	No Change
Does the GSP identify potential impacts to water quality from Projects and Management Actions?	No	Vague description or listed as potential project	Yes	Draft Sufficient

RECOMMENDATIONS

- For DACs and domestic well owners, include a drinking water well impact mitigation program to proactively monitor and protect drinking water wells through GSP implementation. Refer to "Framework for a Drinking Water Well Impact Mitigation Program" for specific recommendations on how to implement a drinking water well mitigation program.³⁹

³⁹ Framework for a Drinking Water Well Impact Mitigation Program. Available at: https://static1.squarespace.com/static/5e83c5f78f0db40cb837cfb5/t/5f3ca9389712b732279e5296/1597811008129/Well_Mitigation_English.pdf

- Recharge ponds, reservoirs, and facilities for managed aquifer recharge can be designed as multiple-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. For guidance on how to integrate multi-benefit recharge projects into your GSP, refer to the “Multi-Benefit Recharge Project Methodology Guidance Document.”⁴⁰

⁴⁰ The Nature Conservancy. 2021. Multi-Benefit Recharge Project Methodology for Inclusion in Groundwater Sustainability Plans. Sacramento. Available at: <https://groundwaterresourcehub.org/sigma-tools/multi-benefit-recharge-project-methodology-guidance/>

Attachment B

Freshwater Species Located in the Modesto Basin

To assist in identifying the beneficial users of surface water necessary to assess the undesirable result “depletion of interconnected surface waters”, Attachment C provides a list of freshwater species located in the Modesto Basin. To produce the freshwater species list, we used ArcGIS to select features within the California Freshwater Species Database version 2.0.9 within the basin boundary. This database contains information on ~4,000 vertebrates, macroinvertebrates and vascular plants that depend on fresh water for at least one stage of their life cycle. The methods used to compile the California Freshwater Species Database can be found in Howard et al. 2015¹. The spatial database contains locality observations and/or distribution information from ~400 data sources. The database is housed in the California Department of Fish and Wildlife’s BIOS² as well as on The Nature Conservancy’s science website³.

Scientific Name	Common Name	Legal Protected Status		
		Federal	State	Other
BIRDS				
<i>Actitis macularius</i>	Spotted Sandpiper			
<i>Aechmophorus clarkii</i>	Clark’s Grebe			
<i>Aechmophorus occidentalis</i>	Western Grebe			
<i>Agelaius tricolor</i>	Tricolored Blackbird	Bird of Conservation Concern	Special Concern	BSSC - First priority
<i>Aix sponsa</i>	Wood Duck			
<i>Anas acuta</i>	Northern Pintail			
<i>Anas americana</i>	American Wigeon			
<i>Anas clypeata</i>	Northern Shoveler			
<i>Anas crecca</i>	Green-winged Teal			
<i>Anas cyanoptera</i>	Cinnamon Teal			
<i>Anas platyrhynchos</i>	Mallard			
<i>Anas strepera</i>	Gadwall			
<i>Anser albifrons</i>	Greater White-fronted Goose			
<i>Ardea alba</i>	Great Egret			
<i>Ardea herodias</i>	Great Blue Heron			
<i>Aythya collaris</i>	Ring-necked Duck			
<i>Aythya marila</i>	Greater Scaup			
<i>Aythya valisineria</i>	Canvasback		Special	
<i>Botaurus lentiginosus</i>	American Bittern			

¹ Howard, J.K. et al. 2015. Patterns of Freshwater Species Richness, Endemism, and Vulnerability in California. PLoS ONE, 11(7). Available at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0130710>

² California Department of Fish and Wildlife BIOS: <https://www.wildlife.ca.gov/data/BIOS>

³ Science for Conservation: <https://www.scienceforconservation.org/products/california-freshwater-species-database>

<i>Bucephala albeola</i>	Bufflehead			
<i>Bucephala clangula</i>	Common Goldeneye			
<i>Butorides virescens</i>	Green Heron			
<i>Calidris alpina</i>	Dunlin			
<i>Calidris mauri</i>	Western Sandpiper			
<i>Calidris minutilla</i>	Least Sandpiper			
<i>Chen caerulescens</i>	Snow Goose			
<i>Chen rossii</i>	Ross's Goose			
<i>Chroicocephalus philadelphia</i>	Bonaparte's Gull			
<i>Cistothorus palustris palustris</i>	Marsh Wren			
<i>Cygnus columbianus</i>	Tundra Swan			
<i>Egretta thula</i>	Snowy Egret			
<i>Empidonax traillii</i>	Willow Flycatcher	Bird of Conservation Concern	Endangered	
<i>Fulica americana</i>	American Coot			
<i>Gallinago delicata</i>	Wilson's Snipe			
<i>Gallinula chloropus</i>	Common Moorhen			
<i>Geothlypis trichas trichas</i>	Common Yellowthroat			
<i>Grus canadensis</i>	Sandhill Crane			
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Bird of Conservation Concern	Endangered	
<i>Himantopus mexicanus</i>	Black-necked Stilt			
<i>Icteria virens</i>	Yellow-breasted Chat		Special Concern	BSSC - Third priority
<i>Limnodromus scolopaceus</i>	Long-billed Dowitcher			
<i>Lophodytes cucullatus</i>	Hooded Merganser			
<i>Megaceryle alcyon</i>	Belted Kingfisher			
<i>Mergus merganser</i>	Common Merganser			
<i>Mergus serrator</i>	Red-breasted Merganser			
<i>Numenius americanus</i>	Long-billed Curlew			
<i>Numenius phaeopus</i>	Whimbrel			
<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron			
<i>Oxyura jamaicensis</i>	Ruddy Duck			
<i>Pelecanus erythrorhynchos</i>	American White Pelican		Special Concern	BSSC - First priority
<i>Phalacrocorax auritus</i>	Double-crested Cormorant			
<i>Plegadis chihi</i>	White-faced Ibis		Watch list	
<i>Pluvialis squatarola</i>	Black-bellied Plover			
<i>Podiceps nigricollis</i>	Eared Grebe			
<i>Podilymbus podiceps</i>	Pied-billed Grebe			

<i>Porzana carolina</i>	Sora			
<i>Rallus limicola</i>	Virginia Rail			
<i>Recurvirostra americana</i>	American Avocet			
<i>Riparia riparia</i>	Bank Swallow		Threatened	
<i>Setophaga petechia</i>	Yellow Warbler			BSSC - Second priority
<i>Tachycineta bicolor</i>	Tree Swallow			
<i>Tringa melanoleuca</i>	Greater Yellowlegs			
<i>Tringa semipalmata</i>	Willet			
<i>Vireo bellii pusillus</i>	Least Bell's Vireo	Endangered	Endangered	
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed Blackbird		Special Concern	BSSC - Third priority
CRUSTACEANS				
<i>Branchinecta conservatio</i>	Conservancy Fairy Shrimp	Endangered	Special	IUCN - Endangere d
<i>Branchinecta lynchi</i>	Vernal Pool Fairy Shrimp	Threatened	Special	IUCN - Vulnerable
<i>Lepidurus packardi</i>	Vernal Pool Tadpole Shrimp	Endangered	Special	IUCN - Endangere d
<i>Linderiella occidentalis</i>	California Fairy Shrimp		Special	IUCN - Near Threatened
<i>Pacifastacus leniusculus leniusculus</i>	Signal Crayfish			
<i>Stygobromus spp.</i>	<i>Stygobromus spp.</i>			
FISH				
<i>Oncorhynchus mykiss irideus</i>	Coastal rainbow trout			Least Concern - Moyle 2013
<i>Mylopharodon conocephalus</i>	Hardhead		Special Concern	Near- Threatened - Moyle 2013
<i>Acipenser medirostris ssp. 1</i>	Southern green sturgeon	Threatened	Special Concern	Endangere d - Moyle 2013
<i>Oncorhynchus mykiss - CV</i>	Central Valley steelhead	Threatened	Special	Vulnerable - Moyle 2013
HERPS				
<i>Actinemys marmorata marmorata</i>	Western Pond Turtle		Special Concern	ARSSC
<i>Ambystoma californiense californiense</i>	California Tiger Salamander	Threatened	Threatened	ARSSC
<i>Anaxyrus boreas boreas</i>	Boreal Toad			

<i>Rana boylei</i>	Foothill Yellow-legged Frog	Under Review in the Candidate or Petition Process	Special Concern	ARSSC
<i>Rana draytonii</i>	California Red-legged Frog	Threatened	Special Concern	ARSSC
<i>Spea hammondi</i>	Western Spadefoot	Under Review in the Candidate or Petition Process	Special Concern	ARSSC
<i>Taricha torosa</i>	Coast Range Newt		Special Concern	ARSSC
<i>Thamnophis gigas</i>	Giant Gartersnake	Threatened	Threatened	
<i>Thamnophis sirtalis sirtalis</i>	Common Gartersnake			
INSECTS & OTHER INVERTS				
<i>Ablabesmyia</i> spp.	<i>Ablabesmyia</i> spp.			
<i>Attenella delantala</i>	A Mayfly			
Baetidae fam.	Baetidae fam.			
<i>Baetis tricaudatus</i>	A Mayfly			
<i>Camelobaetidius</i> spp.	<i>Camelobaetidius</i> spp.			
<i>Centroptilum</i> spp.	<i>Centroptilum</i> spp.			
Chironomidae fam.	Chironomidae fam.			
<i>Cladotanytarsus</i> spp.	<i>Cladotanytarsus</i> spp.			
Corixidae fam.	Corixidae fam.			
<i>Cryptochironomus</i> spp.	<i>Cryptochironomus</i> spp.			
<i>Cryptotendipes</i> spp.	<i>Cryptotendipes</i> spp.			
<i>Dicrotendipes</i> spp.	<i>Dicrotendipes</i> spp.			
<i>Drunella doddsii</i>	A Mayfly			
<i>Epeorus longimanus</i>	A Mayfly			
<i>Fallceon quilleri</i>	A Mayfly			
<i>Gomphus kurilis</i>	Pacific Clubtail			
<i>Hydroptila</i> spp.	<i>Hydroptila</i> spp.			
Leptoceridae fam.	Leptoceridae fam.			
<i>Libellula forensis</i>	Eight-spotted Skimmer			
<i>Nanocladius</i> spp.	<i>Nanocladius</i> spp.			
<i>Nectopsyche</i> spp.	<i>Nectopsyche</i> spp.			
<i>Pantala hymenaea</i>	Spot-winged Glider			
<i>Paratendipes</i> spp.	<i>Paratendipes</i> spp.			
<i>Polypedilum</i> spp.	<i>Polypedilum</i> spp.			
<i>Simulium</i> spp.	<i>Simulium</i> spp.			
<i>Sperchon</i> spp.	<i>Sperchon</i> spp.			
<i>Tanytarsus</i> spp.	<i>Tanytarsus</i> spp.			
<i>Tricorythodes</i> spp.	<i>Tricorythodes</i> spp.			

MAMMALS				
Castor canadensis	American Beaver			Not on any status lists
Lontra canadensis canadensis	North American River Otter			Not on any status lists
Neovison vison	American Mink			Not on any status lists
Ondatra zibethicus	Common Muskrat			Not on any status lists
MOLLUSKS				
Anodonta californiensis	California Floater		Special	
Gonidea angulata	Western Ridged Mussel		Special	
Helisoma spp.	Helisoma spp.			
Margaritifera falcata	Western Pearlshell		Special	
Physa spp.	Physa spp.			
PLANTS				
Castilleja campestris succulenta	Fleshy Owl's-clover	Threatened	Endangered	CRPR - 1B.2
Downingia pusilla	Dwarf Downingia		Special	CRPR - 2B.2
Neostapfia colusana	Colusa Grass	Threatened	Endangered	CRPR - 1B.1
Orcuttia pilosa	Hairy Orcutt Grass	Endangered	Endangered	CRPR - 1B.1
Tuctoria greenei	Green's Awnless Orcutt Grass	Endangered	Rare	CRPR - 1B.1
Alopecurus saccatus	Pacific Foxtail			
Arundo donax	NA			
Baccharis salicina				Not on any status lists
Bidens laevis	Smooth Bur-marigold			
Bidens tripartita	NA			
Brodiaea nana				Not on any status lists
Callitriche heterophylla heterophylla	Northern Water-starwort			
Callitriche marginata	Winged Water-starwort			
Cicendia quadrangularis	Oregon Microcala			
Cotula coronopifolia	NA			
Damasonium californicum				Not on any status lists
Downingia bella	Hoover's Downingia			
Downingia cuspidata	Toothed Calicoflower			
Downingia ornatissima	NA			
Eleocharis flavescens flavescens	Pale Spikerush			

<i>Epilobium cleistogamum</i>	Cleistogamous Spike-primrose			
<i>Eryngium vaseyi vaseyi</i>	Vasey's Coyote-thistle			Not on any status lists
<i>Euthamia occidentalis</i>	Western Fragrant Goldenrod			
<i>Gratiola ebracteata</i>	Bractless Hedge-hyssop			
<i>Isoetes orcuttii</i>	NA			
<i>Juncus acuminatus</i>	Sharp-fruit Rush			
<i>Lasthenia fremontii</i>	Fremont's Goldfields			
<i>Leersia oryzoides</i>	Rice Cutgrass			
<i>Lemna gibba</i>	Inflated Duckweed			
<i>Lemna minor</i>	Lesser Duckweed			
<i>Lemna minuta</i>	Least Duckweed			
<i>Limnanthes douglasii douglasii</i>	Douglas' Meadowfoam			
<i>Limnanthes douglasii rosea</i>	Douglas' Meadowfoam			
<i>Lipocarpa micrantha</i>	Dwarf Bulrush			
<i>Mimulus latidens</i>	Broad-tooth Monkeyflower			
<i>Mimulus pilosus</i>				Not on any status lists
<i>Mimulus ringens</i>	Square-stem Monkeyflower			
<i>Mimulus tricolor</i>	Tricolor Monkeyflower			
<i>Myosurus minimus</i>	NA			
<i>Myosurus sessilis</i>	Sessile Mousetail			
<i>Navarretia leucocephala leucocephala</i>	White-flower Navarretia			
<i>Paspalum distichum</i>	Joint Paspalum			
<i>Plagiobothrys acanthocarpus</i>	Adobe Popcorn-flower			
<i>Plagiobothrys austiniae</i>	Austin's Popcorn-flower			
<i>Plagiobothrys humistratus</i>	Dwarf Popcorn-flower			
<i>Plantago elongata elongata</i>	Slender Plantain			
<i>Potamogeton illinoensis</i>	Illinois Pondweed			
<i>Psilocarphus brevissimus brevissimus</i>	Dwarf Woolly-heads			
<i>Psilocarphus oregonus</i>	Oregon Woolly-heads			
<i>Psilocarphus tenellus</i>	NA			
<i>Rumex conglomeratus</i>	NA			
<i>Salix exigua exigua</i>	Narrowleaf Willow			
<i>Sidalcea hirsuta</i>	Hairy Checker-mallow			
<i>Symphyotrichum lentum</i>	Suisun Marsh Aster		Special	CRPR - 1B.2

Attachment C

Maps of representative monitoring sites in relation to key beneficial users

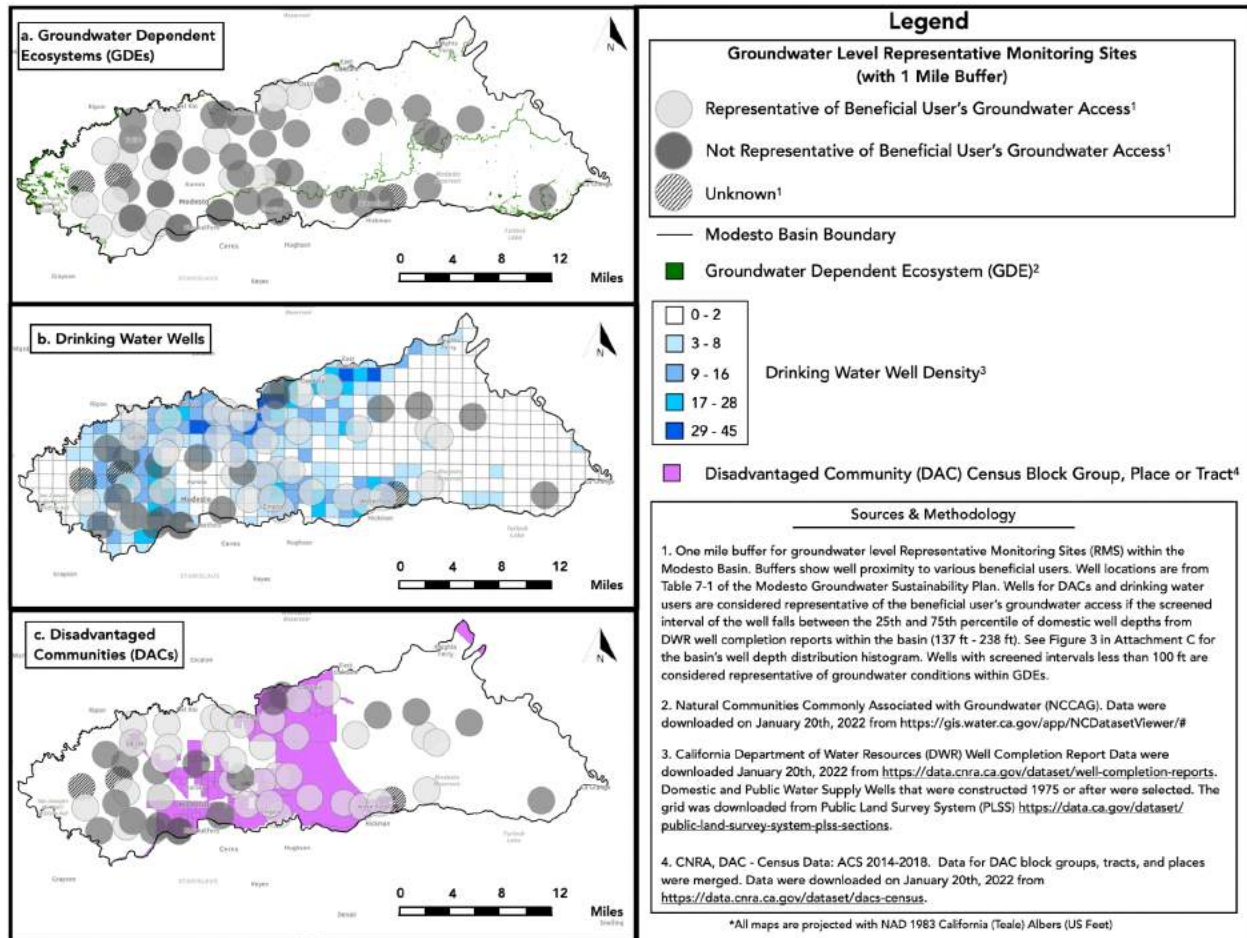


Figure 1. Groundwater elevation representative monitoring sites in relation to key beneficial users: a) Groundwater Dependent Ecosystems (GDEs), b) Drinking Water users, c) Disadvantaged Communities (DACs), and d) Tribes.

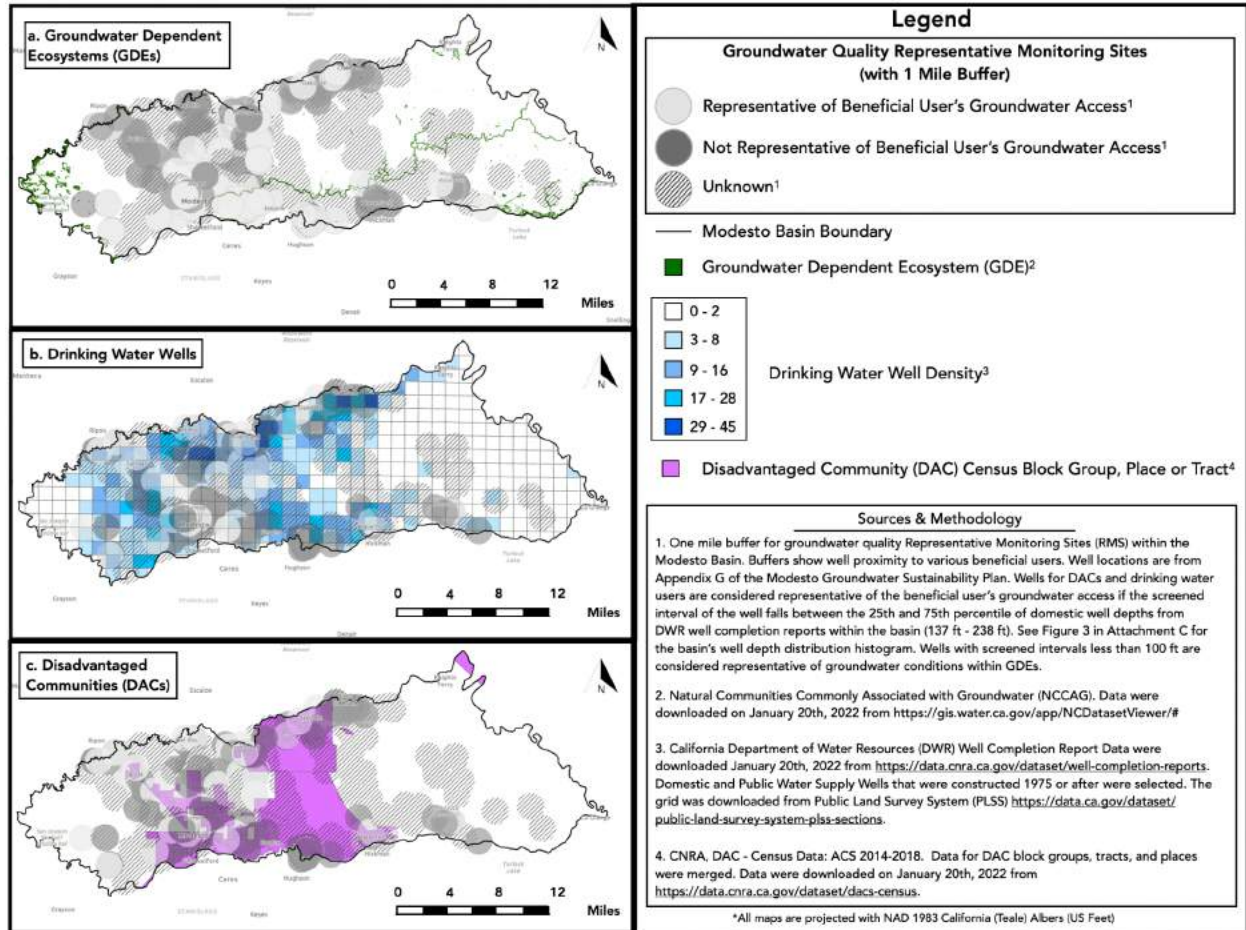


Figure 2. Groundwater quality representative monitoring sites in relation to key beneficial users: a) Groundwater Dependent Ecosystems (GDEs), b) Drinking Water users, c) Disadvantaged Communities (DACs), and d) Tribes.

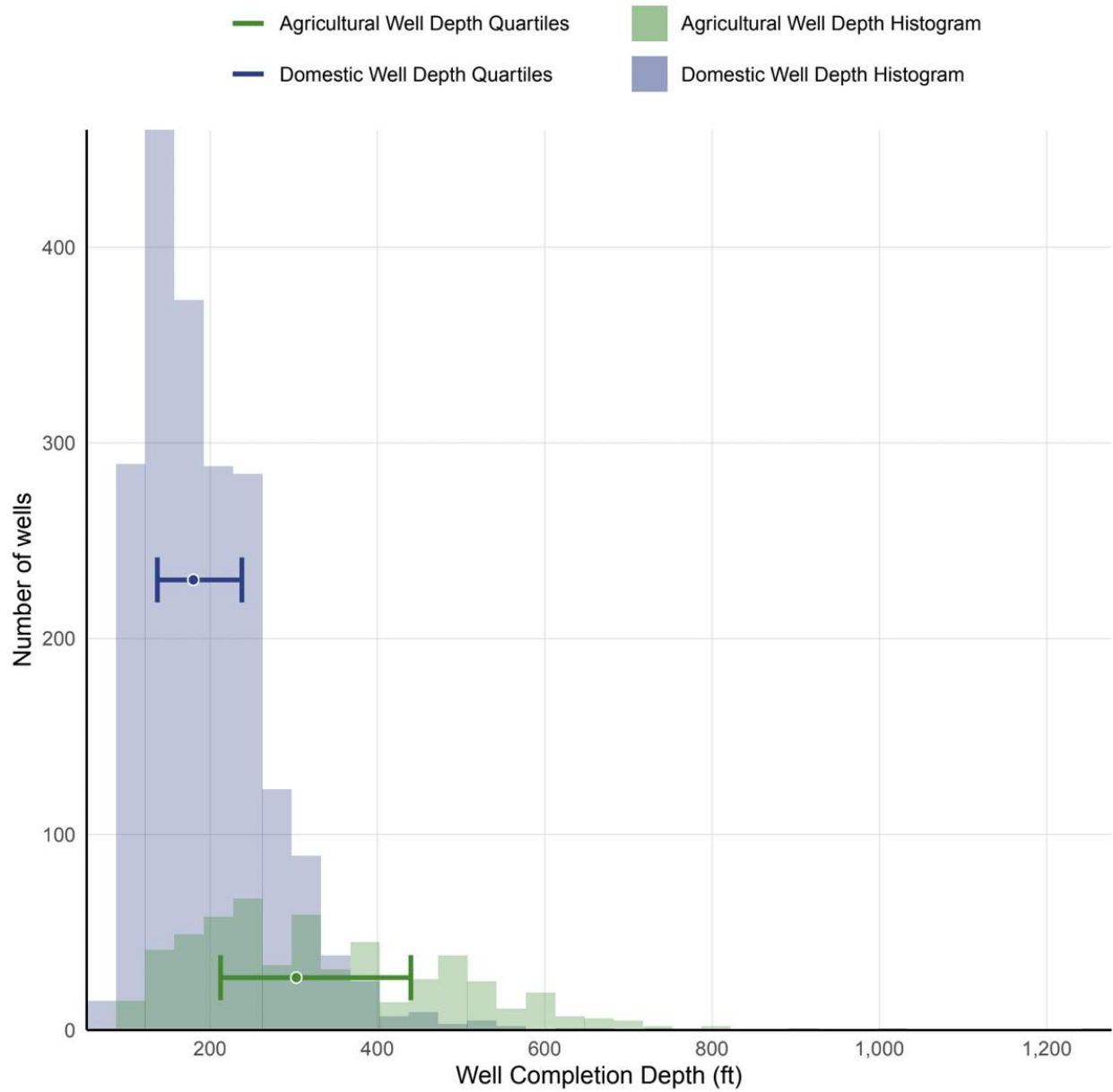


Figure 3. Groundwater well depth histogram for domestic (blue) and agricultural (green) wells. If less than 10 agricultural or domestic wells are present within the basin, the sector histogram is not shown. Data from California Department of Water Resources' Online System for Well Completion Reports (<https://data.cnra.ca.gov/dataset/well-completion-reports>).