






October 24, 2021

Wyandotte Creek GSA
308 Nelson Avenue
Oroville, CA 95965

*Submitted via email: wyandottegsa@gmail.com*

**Re: Public Comment Letter for Wyandotte Creek Groundwater Subbasin Draft GSP**

Dear Christina Buck,

On behalf of the above-listed organizations, we appreciate the opportunity to comment on the Draft Groundwater Sustainability Plan (GSP) for the Wyandotte Creek Groundwater Subbasin being prepared under the Sustainable Groundwater Management Act (SGMA). Our organizations are deeply engaged in and committed to the successful implementation of SGMA because we understand that groundwater is critical for the resilience of California's water portfolio, particularly in light of changing climate. Under the requirements of SGMA, Groundwater Sustainability Agencies (GSAs) must consider the interests of all beneficial uses and users of groundwater, such as domestic well owners, environmental users, surface water users, federal government, California Native American tribes and disadvantaged communities (Water Code 10723.2).

As stakeholder representatives for beneficial users of groundwater, our GSP review focuses on how well disadvantaged communities, drinking water users, tribes, climate change, and the environment were addressed in the GSP. While we appreciate that some basins have consulted us directly via focus groups, workshops, and working groups, we are providing public comment letters to all GSAs as a means to engage in the development of 2022 GSPs across the state. Recognizing that GSPs are complicated and resource intensive to develop, the intention of this letter is to provide constructive stakeholder feedback that can improve the GSP prior to submission to the State.

Based on our review, we have significant concerns regarding the treatment of key beneficial users in the Draft GSP and consider the GSP to be **insufficient** under SGMA. We highlight the following findings:

1. Beneficial uses and users **are not sufficiently** considered in GSP development.
    a. Human Right to Water considerations **are not sufficiently** incorporated.
    b. Public trust resources **are not sufficiently** considered.
    c. Impacts of Minimum Thresholds, Measurable Objectives and Undesirable Results on beneficial uses and users **are not sufficiently** analyzed.

2. Climate change **is not sufficiently** considered.
3. Data gaps **are not sufficiently** identified and the GSP **does not have a plan** to eliminate them.
4. Projects and Management Actions **do not sufficiently consider** potential impacts or benefits to beneficial uses and users.

Our specific comments related to the deficiencies of the Wyandotte Creek Groundwater Subbasin Draft GSP along with recommendations on how to reconcile them, are provided in detail in **Attachment A.**

Please refer to the enclosed list of attachments for additional technical recommendations:

| | |
|---|---|
| **Attachment A** | GSP Specific Comments |
| **Attachment B** | SGMA Tools to address DAC, drinking water, and environmental beneficial uses and users |
| **Attachment C** | Freshwater species located in the basin |
| **Attachment D** | The Nature Conservancy's "Identifying GDEs under SGMA: Best Practices for using the NC Dataset" |
| **Attachment E** | Maps of representative monitoring sites in relation to key beneficial users |

Thank you for fully considering our comments as you finalize your GSP.

Best Regards,

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Melissa M. Rohde
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# Attachment A

**Specific Comments on the Wyandotte Creek Groundwater Subbasin Draft Groundwater Sustainability Plan**

## 1. Consideration of Beneficial Uses and Users in GSP development

Consideration of beneficial uses and users in GSP development is contingent upon adequate identification and engagement of the appropriate stakeholders. The (A) identification, (B) engagement, and (C) consideration of disadvantaged communities, drinking water users, tribes,[1] groundwater dependent ecosystems, streams, wetlands, and freshwater species are essential for ensuring the GSP integrates existing state policies on the Human Right to Water and the Public Trust Doctrine.

### A. Identification of Key Beneficial Uses and Users

**Disadvantaged Communities, Drinking Water Users, and Tribes**

The identification of Disadvantaged Communities (DACs), drinking water users, and tribes is **insufficient**. We note the following deficiencies with the identification of these key beneficial users.

- The GSP provides information on DACs, including identification by name and location on a map, but fails to provide the population of each DAC within the subbasin.
- The GSP fails to provide a map of tribal lands within the subbasin.
- While the GSP provides a map of domestic well density in Figure 1-9, the plan does not provide the depth of these wells (such as minimum well depth, average well depth, or depth range) within the subbasin.
- The GSP fails to identify the population dependent on groundwater as their source of drinking water in the subbasin. Specifics are not provided on how much each DAC community relies on a particular water supply (e.g., what percentage is supplied by groundwater).

These missing elements are required for the GSAs to fully understand the specific interests and water demands of these beneficial users, and to support the consideration of beneficial users in the development of sustainable management criteria and selection of projects and management actions.

| RECOMMENDATIONS |
| --- |
| • Provide the population of each identified DAC. Identify the sources of drinking water for DAC members, including an estimate of how many people rely on groundwater (e.g., domestic wells, state small water systems, and public water systems). |

[1] Our letter provides a review of the identification and consideration of federally recognized tribes (Data source: SGMA Data viewer) within the GSP from non-tribal members and NGOs. Based on the likely incomplete information available to our organizations for this review, we recommend that the GSA utilize the California Department of Water Resources' "Engagement with Tribal Governments" Guidance Document (https://water.ca.gov/Programs/Groundwater-Management/SGMA-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents) to comprehensively address these important beneficial users in their GSP.

- Provide a map of tribal lands within the subbasin.
- Include a map showing domestic well locations and average well depth across the subbasin.

**Interconnected Surface Waters**

The identification of Interconnected Surface Waters (ISWs) is **insufficient**, due to lack of supporting information provided for the ISW analysis. The GSP describes use of the BBGM (Butte Basin Groundwater Model), however does not present a thorough description of the data used in the model, such as the groundwater level monitoring well data and stream gauge data that were incorporated into the model. Additionally, no description was provided of the temporal (seasonal and interannual) variability of the data used to calibrate the model. This information should be provided in the GSP to support the conclusions presented.

The GSP states (p. 46): *"Based on consideration of the frequency with which stream segments are gaining based on BBGM results and on consideration of the spring depth to groundwater below the estimated streambed depth along each primary stream, it is likely that all streams traversing or bounding the subbasin are connected to the groundwater system."* Figure 2-20 presents a map of stream reaches in the subbasin, showing the percentage of months of either a gaining or losing condition in the subbasin as predicted by the BBGM model. We recommend that the reaches are also labeled as interconnected, so that it is clear that all stream segments are retained as ISWs in the GSP.

**RECOMMENDATIONS**

- Label stream reaches on Figure 2-20 as interconnected (gaining/losing), to make clear that all stream segments are retained as ISWs in the GSP.
- Further describe the groundwater elevation data and stream flow data used in the BBGM analysis.
- To confirm and illustrate the results of the groundwater modeling, overlay the stream reaches shown on Figure 2-20 with 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.
- For the depth-to-groundwater contour maps, use the best practices presented in Attachment D. Specifically, ensure that the first step is contouring groundwater elevations, and then subtracting this layer from land surface elevations from a Digital Elevation Model (DEM) to estimate depth-to-groundwater contours across the landscape. This will provide accurate contours of depth to groundwater along streams and other land surface depressions where GDEs are commonly found.
- Describe data gaps for the ISW analysis in the ISW section, in addition to the discussion in the monitoring network section (4.10 Network Assessment and Improvements).

**Groundwater Dependent Ecosystems**

The identification of Groundwater Dependent Ecosystems (GDEs) is **insufficient**. The GSP does not discuss how the Natural Communities Commonly Associated with Groundwater dataset (NC dataset) was verified with the use of groundwater data from the shallow aquifer. Without an analysis of groundwater data to verify the NC dataset polygons, it will be difficult or impossible to adequately monitor and manage the subbasin's GDEs throughout GSP implementation.

The GSP took initial steps to identify and map GDEs using the NC dataset and other sources. However, we found that some mapped features in the NC dataset were improperly disregarded. NC dataset polygons were incorrectly removed in areas adjacent to irrigated fields or due to the presence of surface water supplies. However, this removal criteria is flawed since GDEs, in addition to groundwater, can rely on multiple water sources – including shallow groundwater receiving inputs from irrigation return flow from nearby irrigated fields – simultaneously and at different temporal/spatial scales. NC dataset polygons adjacent to irrigated land or surface water supplies can still potentially be reliant on shallow groundwater aquifers, and therefore should not be removed solely based on their proximity to irrigated fields or surface water.

The GSP did not discuss the flora or fauna species present in the subbasin's GDEs, except to acknowledge the presence of Valley oak (*Quercus lobata*) in the subbasin. We commend the GSA for retaining all Valley oak polygons in the NC dataset based on the recognition that they can access groundwater at deeper depths.

**RECOMMENDATIONS**

- Provide a comprehensive set of maps for the subbasin's GDEs. For example, provide a map of the NC Dataset. On the map, label polygons retained, removed, or added to/from the NC dataset (include the removal reason if polygons are not considered potential GDEs, or include the data source if polygons are added). Discuss how local groundwater data was used to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer. Refer to Attachment D of this letter for best practices for using local groundwater data to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer.

- 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 Attachment D of this letter for best practices for using local groundwater data to verify whether polygons in the NC Dataset are supported by groundwater in an aquifer.

- Provide depth-to-groundwater contour maps, noting the best practices presented in Attachment D. Specifically, ensure that the first step is contouring groundwater elevations, and then subtracting this layer from land surface elevations from a DEM to estimate depth-to-groundwater contours across the landscape.

- 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. It is not clear from the description in the GSP whether NC dataset polygons labeled as 'Not Likely a GDE' on Figure 2-23 are retained as potential GDEs.

- Include an inventory of the fauna and flora present within the subbasin's GDEs (see Attachment C of this letter for a list of freshwater species located in the Wyandotte Creek Subbasin). Note any threatened or endangered species.

**Native Vegetation and Managed Wetlands**

Native vegetation and managed wetlands are water use sectors that are required to be included in the water budget.[2,3] The integration of these ecosystems into the water budget is **sufficient** because the groundwater demands of native vegetation and managed wetlands are included in the historical, current, and projected water budgets. Additional clarification is needed on the managed wetland acres represented in the basin water budget to ensure all managed wetlands are captured. DWR's Statewide Crop Mapping layer is one spatial dataset that indicates managed wetland extent.

**RECOMMENDATION**

- Provide documentation of the managed wetland acres and associated evapotranspiration values that are used as inputs in the water budget model (BCDWRC 2021).

## B. Engaging Stakeholders

**Stakeholder Engagement during GSP development**

Stakeholder engagement during GSP development is **insufficient**. SGMA's requirement for public notice and engagement of stakeholders is not fully met by the description in the Communication and Engagement Plan (Appendix 1-C).[4]

The Communication and Engagement Plan documents representation of tribal and environmental interests on the Wyandotte Creek Advisory Committee (WAC). However, we note the following deficiencies with the overall stakeholder engagement process:

- The opportunities for public involvement and engagement with DACs and drinking water users are described in very general terms, including attending GSA Board and public meetings, WAC meetings, public workshops, subbasin-wide Technical Advisory Committee meetings, Farm Bureau Water Forum meetings, City of Oroville meetings, and Regional Water Management Group meetings. No specific outreach targeted to DACs and drinking water users is described in the GSP, nor does the GSP document how feedback from stakeholders was incorporated into the GSP development.

[2] "'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(al)]

[3] "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]

[4] "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)]

- The Communication and Engagement Plan does not include a specific plan with details for continual opportunities for engagement through the *implementation* phase of the GSP for DACs, drinking water users, tribes, and environmental stakeholders.

**RECOMMENDATIONS**

- In the Communication and Engagement Plan, describe active and targeted outreach to engage DACs, drinking water users, environmental stakeholders and consultation to tribes through the GSP development *and* implementation phases. Refer to Attachment B for specific recommendations on how to actively engage stakeholders during all phases of the GSP process.

- Utilize DWR's tribal engagement guidance to comprehensively address all tribes and tribal interests in the subbasin within the GSP.[5]

## C. Considering Beneficial Uses and Users When Establishing Sustainable Management Criteria and Analyzing Impacts on Beneficial Uses and Users

The consideration of beneficial uses and users when establishing sustainable management criteria (SMC) is **insufficient**. The consideration of potential impacts on all beneficial users of groundwater in the basin are required when defining undesirable results and establishing minimum thresholds.[6,7,8]

**Disadvantaged Communities and Drinking Water Users**

For chronic lowering of groundwater levels, the GSP discusses minimum threshold impacts on domestic wells (see Section 3.3.2 Minimum Thresholds). The GSP states (p. 88): "*In recent years, Butte County has documented a number of domestic wells that have gone dry, meaning groundwater levels have fallen below the depth of the well installation and/or pump throughout the County. This occurred during summer months of recent drought years and heightened concern among some stakeholders. As a result, domestic well reliability and protection are the focus of the Groundwater Levels MT*."

The plan states that *"the quantitative Wyandotte Creek Subbasin Undesirable Result for the Chronic Lowering of Groundwater Levels occurs when: two RMS wells within a management area reach their MT for two consecutive non-dry year-types."* This information suggests that minimum thresholds reached during dry years or periods of drought will not result in an undesirable result.

The GSP also discusses the use of the DWR domestic well database and sets minimum threshold levels protective of domestic wells by establishing a representative zone for each RMS

[5] 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_ay_19.pdf

[6] "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)]

[7] "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)]

[8] "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)]

well. The resulting minimum thresholds are protective of 85% of domestic wells. Despite this well impact analysis, the GSP does not sufficiently describe whether minimum thresholds will avoid significant and unreasonable loss of drinking water to domestic well users in those 15% of wells not protected by the MT, and whether the undesirable results are consistent with California's Human Right to Water policy.[9]

The GSP does not, however, sufficiently describe or analyze direct or indirect impacts on DACs, drinking water users or tribes when defining undesirable results, nor does it describe how the existing minimum threshold groundwater levels are consistent with avoiding undesirable results to DACs and tribes in the subbasin.

For degraded water quality, salinity is the only constituent of concern (COC) for which SMC are established in the subbasin. The minimum threshold is set to the upper limit of the Secondary Maximum Contaminant Level (SMCL) for specific conductance based on the state secondary drinking water standards. The GSP states (p. 93): "*Other constituents, as discussed in Section 2.2.4, are managed through existing management and regulatory programs within the Subbasin, such as the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) and the Irrigated Lands Regulatory Program (ILRP), which focus on improving water quality by managing septic and agricultural sources of salinity and nutrients. Additionally, point-source contaminants are managed and regulated through a variety of programs by the Regional Water Quality Control Board (RWQCB), Department of Toxic Substances Control (DTSC), and the U.S. Environmental Protection Agency (EPA).*" However, SMC should be established for all COCs in the subbasin including chemicals of emerging concern (CEC) impacted or exacerbated by groundwater use and/or management, in addition to coordinating with water quality regulatory programs.

The GSP only includes a very general discussion of impacts on drinking water users when defining undesirable results and evaluating the impacts of proposed minimum thresholds for water quality. The GSP does not, however, mention or discuss direct and indirect impacts on DACs or tribes when defining undesirable results for degraded water quality, nor does it evaluate the cumulative or indirect impacts of proposed minimum thresholds on DACs or tribes.

**RECOMMENDATIONS**

**Chronic Lowering of Groundwater Levels**

- Describe direct and indirect impacts on drinking water users, DACs and tribes when describing undesirable results and defining minimum thresholds for chronic lowering of groundwater levels including dry years and periods of drought.

**Degraded Water Quality**

- Describe direct and indirect impacts on drinking water users, DACs, and tribes when defining undesirable results for degraded water quality. For specific guidance on how to consider these users, refer to "Guide to Protecting Water Quality Under the Sustainable Groundwater Management Act."[10]

- Evaluate the cumulative or indirect impacts of proposed minimum thresholds for degraded water quality on drinking water users, DACs, and tribes.

[9] California Water Code §106.3. Available at: https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=WAT&sectionNum=106.3

[10] Guide to Protecting Water Quality under the Sustainable Groundwater Management Act https://d3n8a8pro7vhmx.cloudfront.net/communitywatercenter/pages/293/attachments/original/1559328858/Guide_to_Protecting_Drinking_Water_Quality_Under_the_Sustainable_Groundwater_Management_Act.pdf?1559328858.

- Set minimum thresholds and measurable objectives for all water quality constituents within the subbasin that can be impacted and/or exacerbated as a result of groundwater use or groundwater management. Ensure they align with drinking water standards.[11]

**Groundwater Dependent Ecosystems and Interconnected Surface Waters**

Sustainable management criteria for chronic lowering of groundwater levels provided in the GSP do not consider potential impacts to environmental beneficial users. The GSP neither describes nor analyzes direct or indirect impacts on environmental users of groundwater when defining undesirable results. This is problematic because without identifying potential impacts to GDEs, minimum thresholds may compromise, or even destroy, these environmental beneficial users. Since GDEs are present in the subbasin, they must be considered when developing SMC for chronic lowering of groundwater levels.

The GSP recognizes a data gap with respect to the interconnected surface water SMC. The GSP states (p. 98): *"The GSA intends to further evaluate this SMC to avoid undesirable results to aquatic ecosystems and GDEs. To that end, an Interconnected Surface Water SMC framework has been developed for the GSP as described below. This framework will guide future data collection efforts to fill data gaps, either as part of GSP projects and management actions or plan implementation."*

While the data gap is being filled, the SMC for depletion of interconnected surface waters are established by proxy using groundwater levels. The GSP states (p. 99): *"Therefore, at this time, Groundwater Levels SMC are used by proxy and the MT for interconnected surface water is the same as for groundwater levels: Two RMS wells within a management area reach their MT for two consecutive non-dry year-types."* However, no analysis or discussion is presented to describe how the SMC will affect GDEs, or the impact of these minimum thresholds on GDEs in the subbasin. Furthermore, the GSP makes no attempt to evaluate the impacts of the proposed minimum threshold on environmental beneficial users of surface water. The GSP does not explain how the chosen minimum thresholds and measurable objectives avoid significant and unreasonable effects on surface water beneficial users in the subbasin, such as increased mortality and inability to perform key life processes (e.g., reproduction, migration).

**RECOMMENDATIONS**

- Define chronic lowering of groundwater SMC directly for environmental beneficial users of groundwater. 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

[11] "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)]

the subbasin.[12] Defining undesirable results is the crucial first step before the minimum thresholds can be determined.[13]

- When establishing SMC for the subbasin, 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 depletion of interconnected surface water, include a description of potential impacts on instream habitats within ISWs when minimum thresholds in the subbasin are reached.[14] The GSP should confirm that minimum thresholds for ISWs avoid adverse impacts to 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.[6,15]

## 2. Climate Change

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.[16] The effects of climate change will intensify the impacts of water stress on GDEs, making available shallow groundwater resources especially critical to their survival. Condon *et al.* (2020) shows that GDEs are more likely to succumb to water stress and rely more on groundwater during times of drought.[17] When shallow groundwater is unavailable, riparian forests can die off and key life processes (e.g., migration and spawning) for aquatic organisms, such as steelhead, can be impeded.

The integration of climate change into the projected water budget is **insufficient**. The GSP incorporates climate change into the projected water budget using DWR change factors for 2030 and 2070. However, the plan does not consider multiple climate scenarios (e.g., the 2070 extremely wet and extremely dry climate scenarios) in the projected water budget. The GSP should clearly and transparently incorporate the extremely wet and dry scenarios provided by DWR into projected water budgets or select more appropriate extreme scenarios for the subbasin. While these extreme scenarios may have a lower

[12] "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)]
[13] 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)]
[14] "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)]
[15] 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
[16] "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)]
[17] Condon et al. 2020. Evapotranspiration depletes groundwater under warming over the contiguous United States. Nature Communications. Available at: https://www.nature.com/articles/s41467-020-14688-0

likelihood of occurring, their consequences could be significant and their inclusion can help identify important vulnerabilities in the basin's approach to groundwater management.

The GSP incorporates climate change into key inputs (e.g., precipitation and evapotranspiration) of the projected water budget. However, imported water should be adjusted for climate change and clearly incorporated into the surface water flow inputs of the projected water budget. Furthermore, the GSP does not provide a sustainable yield based on the projected water budget with climate change incorporated. If the water budgets are incomplete, including the omission of projected climate change effects on imported water inputs, and sustainable yield is not calculated based on climate change projections, then there is increased uncertainty in virtually every subsequent calculation used to plan for projects, derive measurable objectives, and set minimum thresholds. Plans that do not adequately include climate change projections may underestimate future impacts on vulnerable beneficial users of groundwater such as ecosystems and domestic well owners.

**RECOMMENDATIONS**

- Integrate climate change, including extremely wet and dry scenarios, into all elements of the projected water budget to form the basis for development of sustainable management criteria and projects and management actions.
- Incorporate climate change into surface water flow inputs, including imported water, for the projected water budget.
- Estimate sustainable yield based on the projected water budget with climate change incorporated.
- Incorporate climate change scenarios into projects and management actions.

## 3. Data Gaps

The consideration of beneficial users when establishing monitoring networks is **insufficient**, due to lack of specific plans to increase the Representative Monitoring Sites (RMSs) in the monitoring network that represent water quality conditions and shallow groundwater elevations around DACs, domestic wells, tribes, GDEs, and ISWs in the subbasin.

Figure 4-5 (Groundwater Level RMS Wells) and Figure 4-6 (Water Quality RMS Wells) show that no monitoring wells are located across portions of the subbasin near DACs, domestic wells, and tribes (see maps we've provided in Attachment E). Beneficial users of groundwater may remain unprotected by the GSP without adequate monitoring and identification of data gaps in the shallow aquifer. The Plan therefore fails to meet SGMA's requirements for the monitoring network.[18]

The GSP provides some discussion of data gaps for GDEs and ISWs in Sections 4.10 (Network Assessment and Improvements) and Section 6.1.3 (Data Analysis), however, does not provide specific plans, such as locations or a timeline, to fill the data gaps.

[18] "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)]

**RECOMMENDATIONS**

- Provide maps that overlay current and proposed monitoring well locations with the locations of DACs, domestic wells, tribes, GDEs, and ISWs to clearly identify potentially impacted areas.
- Increase the number of RMSs in the shallow aquifer across the subbasin as needed to adequately monitor all groundwater condition indicators across the basin and at appropriate depths. Prioritize proximity to DACs, domestic wells, tribes, and GDEs when identifying new RMSs.
- 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 subbasin.

## 4. Addressing Beneficial Users in Projects and Management Actions

The consideration of beneficial users when developing projects and management actions is **insufficient** due to the failure to completely identify impacts to water quality from projects and management actions. Additionally, the proposed recharge projects, such as Flood MAR (Section 5.3.4), do not list explicit benefits to DACs within the subbasin. Potential project and management actions may not protect beneficial users. Groundwater sustainability under SGMA is defined not just by sustainable yield, but by the avoidance of undesirable results for *all* beneficial users.

We commend the GSA for including projects and management actions with explicit benefits to the environment (e.g., Oroville Wildlife Area Robinson's Riffle Project, Streamflow Augmentation, Removal of Invasive Species). We also commend the GSA for including the domestic well mitigation program described in Section 5.3.2, with stated priority for disadvantaged communities who are dependent on groundwater.

**RECOMMENDATIONS**

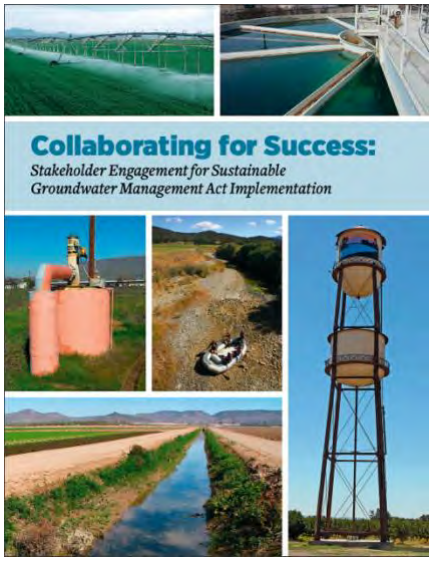
- For DACs and domestic well owners, include a discussion of whether potential impacts to water quality from projects and management actions could occur and how the GSA plans to mitigate such impacts.
- The GSP discusses recharge projects in Section 5.2.4 (Planned Projects). Note that recharge ponds, 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 further guidance on how to integrate multi-benefit recharge projects into your GSP, refer to the "Multi-Benefit Recharge Project Methodology Guidance Document."[19]
- Develop management actions that incorporate climate and water delivery uncertainties to address future water demand and prevent future undesirable results.

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

# Attachment B

## SGMA Tools to address DAC, drinking water, and environmental beneficial uses and users

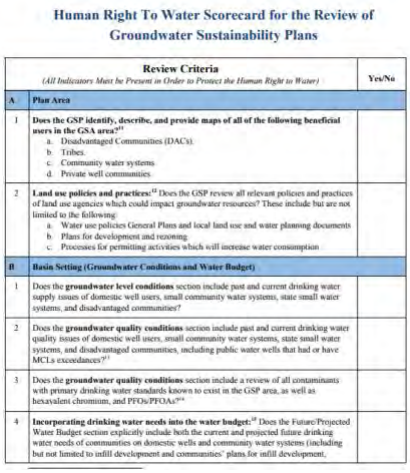
## Stakeholder Engagement and Outreach




Clean Water Action, Community Water Center and Union of Concerned Scientists developed a guidance document called Collaborating for success: Stakeholder engagement for Sustainable Groundwater Management Act Implementation. It provides details on how to conduct targeted and broad outreach and engagement during Groundwater Sustainability Plan (GSP) development and implementation. Conducting a targeted outreach involves:

- Developing a robust Stakeholder Communication and Engagement plan that includes outreach at frequented locations (schools, farmers markets, religious settings, events) across the plan area to increase the involvement and participation of disadvantaged communities, drinking water users and the environmental stakeholders.
- Providing translation services during meetings and technical assistance to enable easy participation for non-English speaking stakeholders.
- GSP should adequately describe the process for requesting input from beneficial users and provide details on how input is incorporated into the GSP.

## The Human Right to Water



**Human Right To Water Scorecard for the Review of Groundwater Sustainability Plans**

| | Review Criteria<br>*(All Indicators Must be Present in Order to Protect the Human Right to Water)* | Yes/No |
|---|---|---|
| A | **Plan Area** | |
| 1 | **Does the GSP identify, describe, and provide maps of all of the following beneficial users in the GSA area?**[43]<br>a. Disadvantaged Communities (DACs).<br>b. Tribes.<br>c. Community water systems.<br>d. Private well communities. | |
| 2 | **Land use policies and practices:**[44] Does the GSP review all relevant policies and practices of land use agencies which could impact groundwater resources? These include but are not limited to the following:<br>a. Water use policies General Plans and local land use and water planning documents<br>b. Plans for development and rezoning.<br>c. Processes for permitting activities which will increase water consumption. | |
| B | **Basin Setting (Groundwater Conditions and Water Budget)** | |
| 1 | Does the **groundwater level conditions** section include past and current drinking water supply issues of domestic well users, small community water systems, state small water systems, and disadvantaged communities? | |
| 2 | Does the **groundwater quality conditions** section include past and current drinking water quality issues of domestic well users, small community water systems, state small water systems, and disadvantaged communities, including public water wells that had or have MCLs exceedances?[45] | |
| 3 | Does the **groundwater quality conditions** section include a review of all contaminants with primary drinking water standards known to exist in the GSP area, as well as hexavalent chromium, and PFOs/PFOAs?[46] | |
| 4 | **Incorporating drinking water needs into the water budget:**[47] Does the Future/Projected Water Budget section explicitly include both the current and projected future drinking water needs of communities on domestic wells and community water systems (including but not limited to infill development and communities' plans for infill development, | |

The Human Right to Water Scorecard was developed by Community Water Center, Leadership Counsel for Justice and Accountability and Self Help Enterprises to aid Groundwater Sustainability Agencies (GSAs) in prioritizing drinking water needs in SGMA. The scorecard identifies elements that must exist in GSPs to adequately protect the Human Right to Drinking water.

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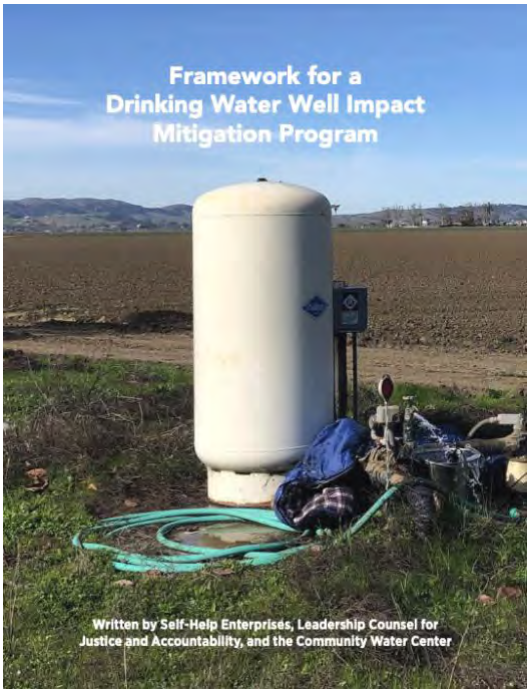
## Drinking Water Well Impact Mitigation Framework




The Drinking Water Well Impact Mitigation Framework was developed by Community Water Center, Leadership Counsel for Justice and Accountability and Self Help Enterprises to aid GSAs in the development and implementation of their GSPs. The framework provides a clear roadmap for how a GSA can best structure its data gathering, monitoring network and management actions to proactively monitor and protect drinking water wells and mitigate impacts should they occur.

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## Groundwater Resource Hub


The Nature Conservancy has developed a suite of tools based on best available science to help GSAs, consultants, and stakeholders efficiently incorporate nature into GSPs. These tools and resources are available online at GroundwaterResourceHub.org. The Nature Conservancy's tools and resources are intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

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## Rooting Depth Database

The Plant Rooting Depth Database provides information that can help assess whether groundwater-dependent vegetation are accessing groundwater. Actual rooting depths will depend on the plant species and site-specific conditions, such as soil type and

availability of other water sources. Site-specific knowledge of depth to groundwater combined with rooting depths will help provide an understanding of the potential groundwater levels are needed to sustain GDEs.

## How to use the database

The maximum rooting depth information in the Plant Rooting Depth Database is useful when verifying whether vegetation in the Natural Communities Commonly Associated with Groundwater (NC Dataset) are connected to groundwater. A 30 ft depth-to-groundwater threshold, which is based on averaged global rooting depth data for phreatophytes[1], is relevant for most plants identified in the NC Dataset since most plants have a max rooting depth of less than 30 feet. However, it is important to note that deeper thresholds are necessary for other plants that have reported maximum root depths that exceed the averaged 30 feet threshold, such as valley oak (*Quercus lobata*), Euphrates poplar (*Populus euphratica*), salt cedar (*Tamarix spp.*), and shadescale (*Atriplex confertifolia*). The Nature Conservancy advises that the reported max rooting depth for these deeper-rooted plants be used. For example, a depth-to groundwater threshold of 80 feet should be used instead of the 30 ft threshold, when verifying whether valley oak polygons from the NC Dataset are connected to groundwater. It is important to re-emphasize that actual rooting depth data are limited and will depend on the plant species and site-specific conditions such as soil and aquifer types, and availability to other water sources.

The Plant Rooting Depth Database is an Excel workbook composed of four worksheets:

1. California phreatophyte rooting depth data (included in the NC Dataset)
2. Global phreatophyte rooting depth data
3. Metadata
4. References

## How the database was compiled

The Plant Rooting Depth Database is a compilation of rooting depth information for the groundwater-dependent plant species identified in the NC Dataset. Rooting depth data were compiled from published scientific literature and expert opinion through a crowdsourcing campaign. As more information becomes available, the database of rooting depths will be updated. Please Contact Us if you have additional rooting depth data for California phreatophytes.

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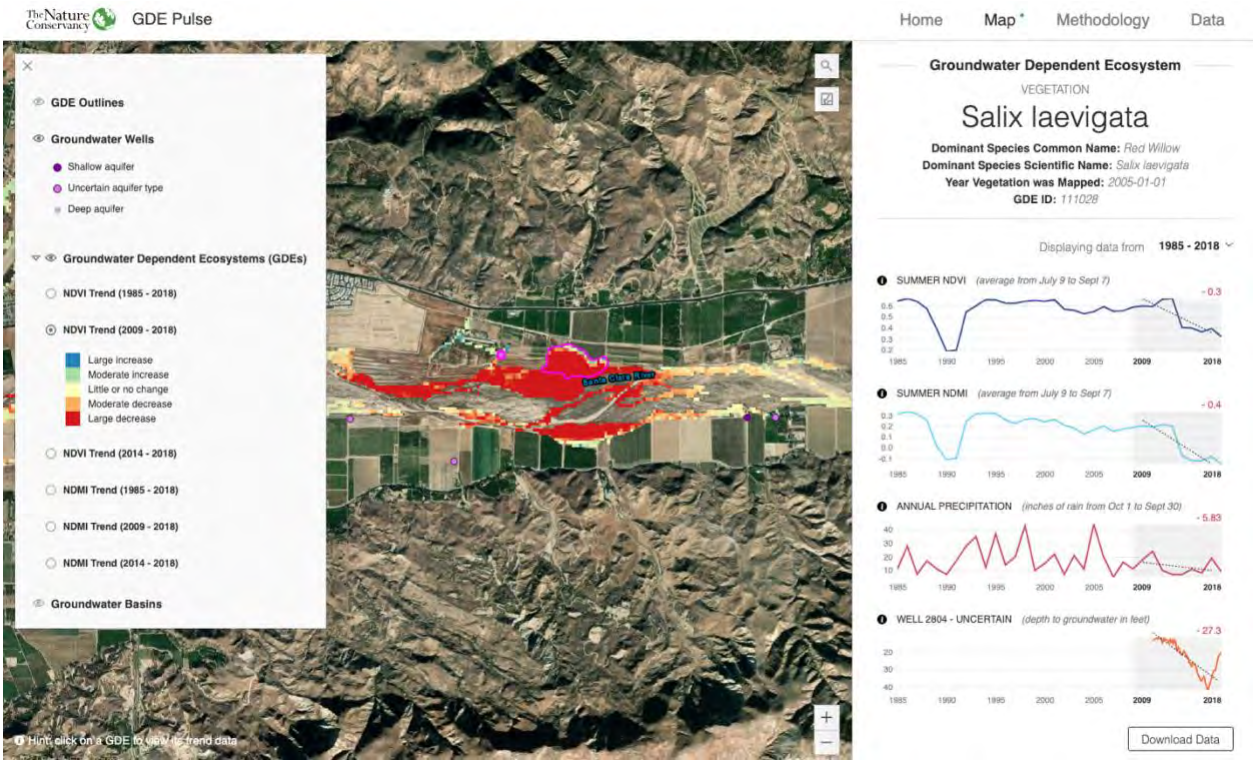
[1] Canadell, J., Jackson, R.B., Ehleringer, J.B. et al. 1996. Maximum rooting depth of vegetation types at the global scale. Oecologia 108, 583–595. https://doi.org/10.1007/BF00329030

# GDE Pulse




GDE Pulse is a free online tool that allows Groundwater Sustainability Agencies to assess changes in groundwater dependent ecosystem (GDE) health using satellite, rainfall, and groundwater data. Remote sensing data from satellites has been used to monitor the health of vegetation all over the planet. GDE pulse has compiled 35 years of satellite imagery from NASA's Landsat mission for every polygon in the Natural Communities Commonly Associated with Groundwater Dataset. The following datasets are available for downloading:

**Normalized Difference Vegetation Index (NDVI)** is a satellite-derived index that represents the greenness of vegetation. Healthy green vegetation tends to have a higher NDVI, while dead leaves have a lower NDVI. We calculated the average NDVI during the driest part of the year (July - Sept) to estimate vegetation health when the plants are most likely dependent on groundwater.

**Normalized Difference Moisture Index (NDMI)** is a satellite-derived index that represents water content in vegetation. NDMI is derived from the Near-Infrared (NIR) and Short-Wave Infrared (SWIR) channels. Vegetation with adequate access to water tends to have higher NDMI, while vegetation that is water stressed tends to have lower NDMI. We calculated the average NDVI during the driest part of the year (July–September) to estimate vegetation health when the plants are most likely dependent on groundwater.

**Annual Precipitation** is the total precipitation for the water year (October 1st – September 30th) from the PRISM dataset. The amount of local precipitation can affect vegetation with more precipitation generally leading to higher NDVI and NDMI.

**Depth to Groundwater** measurements provide an indication of the groundwater levels and changes over time for the surrounding area. We used groundwater well measurements from nearby (<1km) wells to estimate the depth to groundwater below the GDE based on the average elevation of the GDE (using a digital elevation model) minus the measured groundwater surface elevation.

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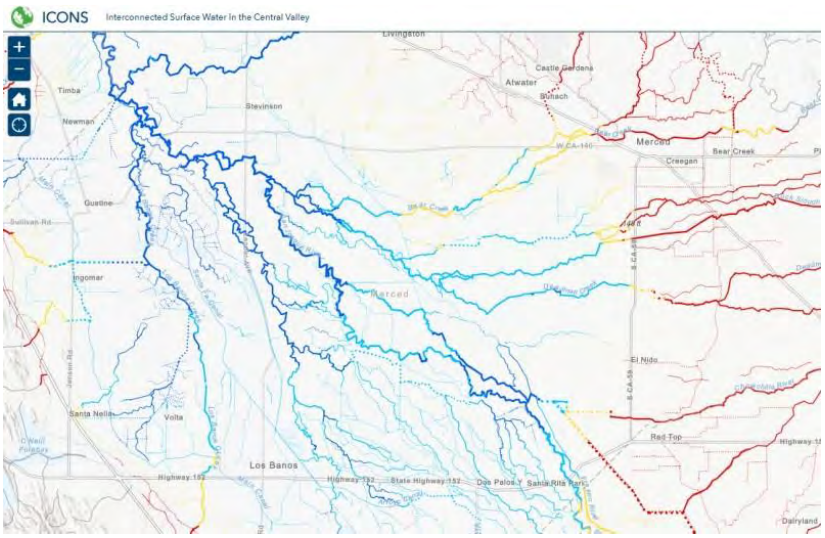
# ICONOS Mapper

## Interconnected Surface Water in the Central Valley




ICONS maps the likely presence of interconnected surface water (ISW) in the Central Valley using depth to groundwater data. Using data from 2011-2018, the ISW dataset represents the likely connection between surface water and groundwater for rivers and streams in California's Central Valley. It includes information on the mean, maximum, and minimum depth to groundwater for each stream segment over the years with available data, as well as the likely presence of ISW based on the minimum depth to groundwater. The Nature Conservancy developed this database, with guidance and input from expert academics, consultants, and state agencies.

We developed this dataset using groundwater elevation data available online from the California Department of Water Resources (DWR). DWR only provides this data for the Central Valley. For GSAs outside of the valley, who have groundwater well measurements, we recommend following our methods to determine likely ISW in your region. The Nature Conservancy's ISW dataset should be used as a first step in reviewing ISW and should be supplemented with local or more recent groundwater depth data.

# Attachment C

## Freshwater Species Located in the Wyandotte Creek Subbasin

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 Wyandotte Creek Subbasin. 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. 2015[1]. 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 BIOS[2] as well as on The Nature Conservancy's science website[3].

| Scientific Name | Common Name | Legal Protected Status | | |
|---|---|---|---|---|
| | | Federal | State | Other |
| **BIRDS** | | | | |
| Riparia riparia | Bank Swallow | | Threatened | |
| Actitis macularius | Spotted Sandpiper | | | |
| Aechmophorus clarkii | Clark's Grebe | | | |
| Aechmophorus occidentalis | Western Grebe | | | |
| Agelaius tricolor | Tricolored Blackbird | Bird of Conservation Concern | Special Concern | BSSC - First priority |
| Aix sponsa | Wood Duck | | | |
| Anas acuta | Northern Pintail | | | |
| Anas americana | American Wigeon | | | |
| Anas clypeata | Northern Shoveler | | | |
| Anas crecca | Green-winged Teal | | | |
| Anas cyanoptera | Cinnamon Teal | | | |
| Anas platyrhynchos | Mallard | | | |
| Anas strepera | Gadwall | | | |
| Anser albifrons | Greater White-fronted Goose | | | |
| Ardea alba | Great Egret | | | |
| Ardea herodias | Great Blue Heron | | | |
| Aythya affinis | Lesser Scaup | | | |
| Aythya collaris | Ring-necked Duck | | | |
| Aythya marila | Greater Scaup | | | |
| Aythya valisineria | Canvasback | | Special | |
| Bucephala albeola | Bufflehead | | | |
| Bucephala clangula | Common Goldeneye | | | |

[1] Howard, J.K. et al. 2015. Patterns of Freshwater Species Richness, Endemism, and Vulnerability in California. PLoSONE, 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

| | | | | |
|---|---|---|---|---|
| Butorides virescens | Green Heron | | | |
| Calidris mauri | Western Sandpiper | | | |
| Calidris minutilla | Least Sandpiper | | | |
| Chen caerulescens | Snow Goose | | | |
| Cistothorus palustris palustris | Marsh Wren | | | |
| Cygnus columbianus | Tundra Swan | | | |
| Egretta thula | Snowy Egret | | | |
| Empidonax traillii | Willow Flycatcher | Bird of Conservation Concern | Endangered | |
| Fulica americana | American Coot | | | |
| Gallinago delicata | Wilson's Snipe | | | |
| Gallinula chloropus | Common Moorhen | | | |
| Grus canadensis | Sandhill Crane | | | |
| Haliaeetus leucocephalus | Bald Eagle | Bird of Conservation Concern | Endangered | |
| Icteria virens | Yellow-breasted Chat | | Special Concern | BSSC - Third priority |
| Limnodromus scolopaceus | Long-billed Dowitcher | | | |
| Lophodytes cucullatus | Hooded Merganser | | | |
| Megaceryle alcyon | Belted Kingfisher | | | |
| Mergus merganser | Common Merganser | | | |
| Nycticorax nycticorax | Black-crowned Night-Heron | | | |
| Oxyura jamaicensis | Ruddy Duck | | | |
| Pelecanus erythrorhynchos | American White Pelican | | Special Concern | BSSC - First priority |
| Phalacrocorax auritus | Double-crested Cormorant | | | |
| Plegadis chihi | White-faced Ibis | | Watch list | |
| Podiceps nigricollis | Eared Grebe | | | |
| Podilymbus podiceps | Pied-billed Grebe | | | |
| Porzana carolina | Sora | | | |
| Rallus limicola | Virginia Rail | | | |
| Setophaga petechia | Yellow Warbler | | | BSSC - Second priority |
| Tachycineta bicolor | Tree Swallow | | | |
| Tringa melanoleuca | Greater Yellowlegs | | | |
| **CRUSTACEANS** | | | | |
| Branchinecta lynchi | Vernal Pool Fairy Shrimp | Threatened | Special | IUCN - Vulnerable |
| Lepidurus packardi | Vernal Pool Tadpole Shrimp | Endangered | Special | IUCN - Endangered |
| Linderiella occidentalis | California Fairy Shrimp | | Special | IUCN - Near Threatened |
| **FISH** | | | | |

| | | | | |
|---|---|---|---|---|
| Oncorhynchus mykiss irideus | Coastal rainbow trout | | | Least Concern - Moyle 2013 |
| Acipenser medirostris ssp. 1 | Southern green sturgeon | Threatened | Special Concern | Endangered - Moyle 2013 |
| Oncorhynchus mykiss - CV | Central Valley steelhead | Threatened | Special | Vulnerable - Moyle 2013 |
| Oncorhynchus tshawytscha - CV spring | Central Valley spring Chinook salmon | Threatened | Threatened | Vulnerable - Moyle 2013 |
| **HERPS** | | | | |
| Actinemys marmorata marmorata | Western Pond Turtle | | Special Concern | ARSSC |
| Anaxyrus boreas boreas | Boreal Toad | | | |
| Rana draytonii | California Red-legged Frog | Threatened | Special Concern | ARSSC |
| Spea hammondii | Western Spadefoot | Under Review in the Candidate or Petition Process | Special Concern | ARSSC |
| Taricha torosa | Coast Range Newt | | Special Concern | ARSSC |
| Thamnophis gigas | Giant Gartersnake | Threatened | Threatened | |
| Thamnophis sirtalis sirtalis | Common Gartersnake | | | |
| **INSECTS & OTHER INVERTS** | | | | |
| Capnia quadrituberosa | Four-knobbed Snowfly | | | |
| Argia emma | Emma's Dancer | | | |
| Enallagma carunculatum | Tule Bluet | | | |
| Enallagma civile | Familiar Bluet | | | |
| Enallagma cyathigerum | | | | Not on any status lists |
| Gyrinus affinis | | | | Not on any status lists |
| Ischnura cervula | Pacific Forktail | | | |
| Ischnura perparva | Western Forktail | | | |
| Libellula saturata | Flame Skimmer | | | |
| Plathemis lydia | Common Whitetail | | | |
| Sympetrum corruptum | Variegated Meadowhawk | | | |
| Tramea lacerata | Black Saddlebags | | | |
| Zoniagrion exclamationis | Exclamation Damsel | | | |
| **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** | | | | |
| Margaritifera falcata | Western Pearlshell | | Special | |
| **PLANTS** | | | | |
| Orcuttia tenuis | Slender Orcutt Grass | Threatened | Endangered | CRPR - 1B.1 |
| Alisma triviale | Northern Water-plantain | | | |
| Alopecurus carolinianus | Tufted Foxtail | | | |
| Alopecurus saccatus | Pacific Foxtail | | | |
| Ammannia coccinea | Scarlet Ammannia | | | |
| Ammannia robusta | Grand Redstem | | | |
| Arundo donax | NA | | | |
| Azolla filiculoides | NA | | | |
| Bacopa rotundifolia | NA | | | |
| Bergia texana | Texas Bergia | | | |
| Bolboschoenus glaucus | NA | | | Not on any status lists |
| Brodiaea nana | | | | Not on any status lists |
| Callitriche heterophylla heterophylla | Northern Water-starwort | | | |
| Callitriche marginata | Winged Water-starwort | | | |
| Callitriche trochlearis | Waste-water Water-starwort | | | |
| Carex densa | Dense Sedge | | | |
| Carex feta | Green-sheath Sedge | | | |
| Carex vulpinoidea | NA | | | |
| Ceratophyllum demersum | Common Hornwort | | | |
| Cicendia quadrangularis | Oregon Microcala | | | |
| Cotula coronopifolia | NA | | | |
| Crassula aquatica | Water Pygmyweed | | | |
| Cyperus bipartitus | Shining Flatsedge | | | |
| Cyperus erythrorhizos | Red-root Flatsedge | | | |
| Cyperus flavescens | NA | | | |
| Downingia bella | Hoover's Downingia | | | |
| Downingia bicornuta | NA | | | |
| Downingia ornatissima | NA | | | |
| Echinodorus berteroi | Upright Burhead | | | |
| Elatine californica | California Waterwort | | | |
| Elatine heterandra | Mosquito Waterwort | | | |
| Eleocharis acicularis acicularis | Least Spikerush | | | |
| Eleocharis acicularis occidentalis | | | | Not on any status lists |
| Eleocharis atropurpurea | Purple Spikerush | | | |
| Eleocharis bella | Delicate Spikerush | | | |
| Eleocharis engelmannii engelmannii | Engelmann's Spikerush | | | Not on any status lists |
| Eleocharis macrostachya | Creeping Spikerush | | | |

| | | | | |
|---|---|---|---|---|
| Eleocharis obtusa | Blunt Spikerush | | | |
| Eleocharis quadrangulata | NA | | | |
| Eleocharis quinqueflora | Few-flower Spikerush | | | |
| Eleocharis radicans | Rooted Spikerush | | | |
| Epilobium campestre | NA | | | Not on any status lists |
| Epilobium cleistogamum | Cleistogamous Spike-primrose | | | |
| Eryngium articulatum | Jointed Coyote-thistle | | | |
| Euthamia occidentalis | Western Fragrant Goldenrod | | | |
| Gratiola ebracteata | Bractless Hedge-hyssop | | | |
| Hydrocotyle umbellata | Many-flower Marsh-pennywort | | | |
| Isoetes howellii | NA | | | |
| Isoetes nuttallii | NA | | | |
| Isolepis cernua | Low Bulrush | | | |
| Juncus acuminatus | Sharp-fruit Rush | | | |
| Juncus articulatus articulatus | | | | Not on any status lists |
| Juncus diffusissimus | NA | | | |
| Juncus effusus pacificus | | | | |
| Juncus uncialis | Inch-high Rush | | | |
| Juncus usitatus | NA | | | Not on any status lists |
| Landoltia punctata | NA | | | Not on any status lists |
| Lasthenia fremontii | Fremont's Goldfields | | | |
| Limnanthes alba alba | White Meadowfoam | | | |
| Limnanthes douglasii douglasii | Douglas' Meadowfoam | | | |
| Limosella acaulis | Southern Mudwort | | | |
| Limosella aquatica | Northern Mudwort | | | |
| Lipocarpha micrantha | Dwarf Bulrush | | | |
| Ludwigia hexapetala | NA | | | Not on any status lists |
| Ludwigia palustris | Marsh Seedbox | | | |
| Ludwigia peploides montevidensis | NA | | | Not on any status lists |
| Lycopus americanus | American Bugleweed | | | |
| Lythrum portula | NA | | | |
| Marsilea vestita vestita | NA | | | Not on any status lists |
| Mimulus guttatus | Common Large Monkeyflower | | | |
| Myosurus minimus | NA | | | |
| Myriophyllum aquaticum | NA | | | |
| Navarretia leucocephala leucocephala | White-flower Navarretia | | | |

| | | | | |
|---|---|---|---|---|
| Panicum dichotomiflorum | NA | | | |
| Paspalum distichum | Joint Paspalum | | | |
| Perideridia kelloggii | Kellogg's Yampah | | | |
| Persicaria hydropiper | NA | | | Not on any status lists |
| Persicaria hydropiperoides | | | | Not on any status lists |
| Persicaria lapathifolia | | | | Not on any status lists |
| Persicaria punctata | NA | | | Not on any status lists |
| Pilularia americana | NA | | | |
| Plagiobothrys greenei | Greene's Popcorn-flower | | | |
| Plagiobothrys leptocladus | Alkali Popcorn-flower | | | |
| Plantago elongata elongata | Slender Plantain | | | |
| Pogogyne douglasii | NA | | | |
| Pogogyne zizyphoroides | | | | Not on any status lists |
| Psilocarphus brevissimus multiflorus | Delta Woolly Marbles | | Special | CRPR - 4.2 |
| Psilocarphus oregonus | Oregon Woolly-heads | | | |
| Ranunculus bonariensis | NA | | | |
| Ranunculus pusillus pusillus | Pursh's Buttercup | | | |
| Ranunculus sceleratus | NA | | | |
| Rorippa curvisiliqua curvisiliqua | Curve-pod Yellowcress | | | |
| Rotala ramosior | Toothcup | | | |
| Sagittaria montevidensis calycina | | | | Not on any status lists |
| Salix exigua hindsiana | | | | Not on any status lists |
| Salix gooddingii | Goodding's Willow | | | |
| Salix lasiolepis lasiolepis | Arroyo Willow | | | |
| Stachys pycnantha | Short-spike Hedge-nettle | | | |
| Stuckenia pectinata | | | | Not on any status lists |
| Typha latifolia | Broadleaf Cattail | | | |
| Wolffia borealis | Dotted Watermeal | | | |
| Wolffia globosa | Asian Watermeal | | | |
| Zizania palustris interior | NA | | | |
| Zizania palustris palustris | NA | | | |

# Attachment D

July 2019

## IDENTIFYING GDEs UNDER SGMA
## Best Practices for using the NC Dataset

The Sustainable Groundwater Management Act (SGMA) requires that groundwater dependent ecosystems (GDEs) be identified in Groundwater Sustainability Plans (GSPs). As a starting point, the Department of Water Resources (DWR) is providing the Natural Communities Commonly Associated with Groundwater Dataset (NC Dataset) online[1] to help Groundwater Sustainability Agencies (GSAs), consultants, and stakeholders identify GDEs within individual groundwater basins. To apply information from the NC Dataset to local areas, GSAs should combine it with the best available science on local hydrology, geology, and groundwater levels to verify whether polygons in the NC dataset are likely supported by groundwater in an aquifer (Figure 1)[2]. This document highlights six best practices for using local groundwater data to confirm whether mapped features in the NC dataset are supported by groundwater.

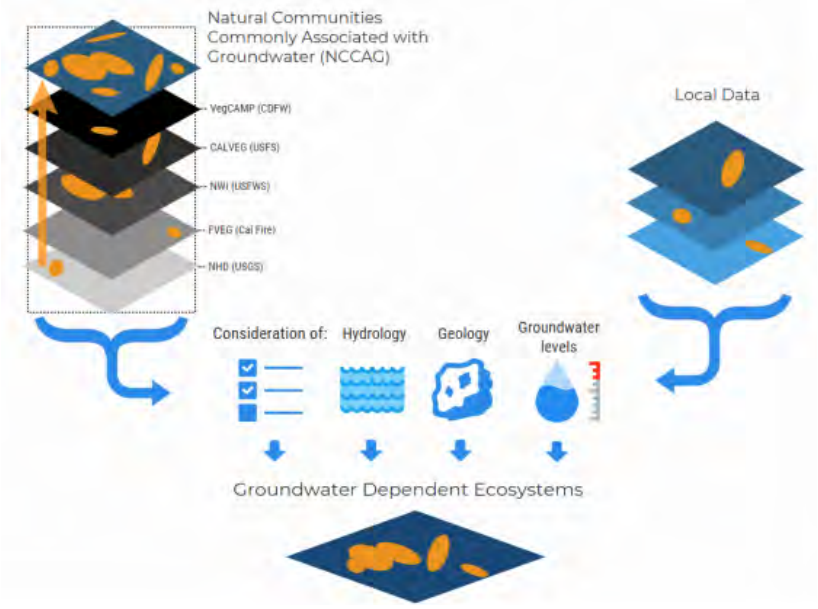



**Figure 1. Considerations for GDE identification.**
Source: DWR[2]

[1] NC Dataset Online Viewer: https://gis.water.ca.gov/app/NCDatasetViewer/
[2] California Department of Water Resources (DWR). 2018. Summary of the "Natural Communities Commonly Associated with Groundwater" Dataset and Online Web Viewer. Available at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Statewide-Reports/Natural-Communities-Dataset-Summary-Document.pdf

The NC Dataset identifies vegetation and wetland features that are good indicators of a GDE. The dataset is comprised of 48 publicly available state and federal datasets that map vegetation, wetlands, springs, and seeps commonly associated with groundwater in California[3]. It was developed through a collaboration between DWR, the Department of Fish and Wildlife, and The Nature Conservancy (TNC). TNC has also provided detailed guidance on identifying GDEs from the NC dataset[4] on the Groundwater Resource Hub[5], a website dedicated to GDEs.

## BEST PRACTICE #1. Establishing a Connection to Groundwater

Groundwater basins can be comprised of one continuous aquifer (Figure 2a) or multiple aquifers stacked on top of each other (Figure 2b). In unconfined aquifers (Figure 2a), using the depth-to-groundwater and the rooting depth of the vegetation is a reasonable method to infer groundwater dependence for GDEs. If groundwater is well below the rooting (and capillary) zone of the plants and any wetland features, the ecosystem is considered disconnected and groundwater management is not likely to affect the ecosystem (Figure 2d). However, it is important to consider local conditions (e.g., soil type, groundwater flow gradients, and aquifer parameters) and to review groundwater depth data from multiple seasons and water year types (wet and dry) because intermittent periods of high groundwater levels can replenish perched clay lenses that serve as the water source for GDEs (Figure 2c). Maintaining these natural groundwater fluctuations are important to sustaining GDE health.

Basins with a stacked series of aquifers (Figure 2b) may have varying levels of pumping across aquifers in the basin, depending on the production capacity or water quality associated with each aquifer. If pumping is concentrated in deeper aquifers, SGMA still requires GSAs to sustainably manage groundwater resources in shallow aquifers, such as perched aquifers, that support springs, surface water, domestic wells, and GDEs (Figure 2). This is because vertical groundwater gradients across aquifers may result in pumping from deeper aquifers to cause adverse impacts onto beneficial users reliant on shallow aquifers or interconnected surface water. The goal of SGMA is to sustainably manage groundwater resources for current and future social, economic, and environmental benefits. While groundwater pumping may not be currently occurring in a shallower aquifer, use of this water may become more appealing and economically viable in future years as pumping restrictions are placed on the deeper production aquifers in the basin to meet the sustainable yield and criteria. Thus, identifying GDEs in the basin should done irrespective to the amount of current pumping occurring in a particular aquifer, so that future impacts on GDEs due to new production can be avoided. A good rule of thumb to follow is: *if groundwater can be pumped from a well - it's an aquifer*.

[3] For more details on the mapping methods, refer to: Klausmeyer, K., J. Howard, T. Keeler-Wolf, K. Davis-Fadtke, R. Hull, A. Lyons. 2018. Mapping Indicators of Groundwater Dependent Ecosystems in California: Methods Report. San Francisco, California. Available at: https://groundwaterresourcehub.org/public/uploads/pdfs/iGDE_data_paper_20180423.pdf
[4] "Groundwater Dependent Ecosystems under the Sustainable Groundwater Management Act: Guidance for Preparing Groundwater Sustainability Plans" is available at: https://groundwaterresourcehub.org/gde-tools/gsp-guidance-document/
[5] The Groundwater Resource Hub: www.GroundwaterResourceHub.org

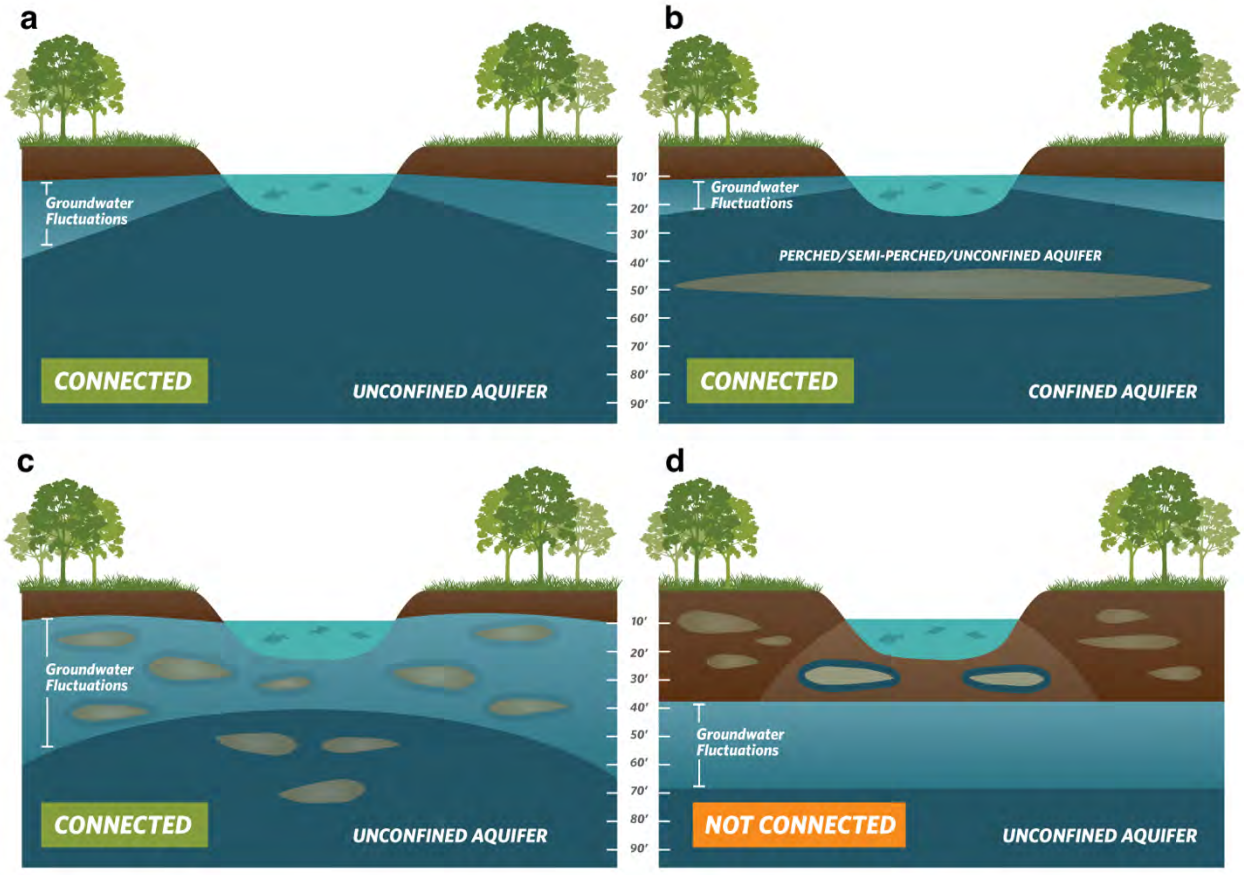



Figure 2. Confirming whether an ecosystem is connected to groundwater. Top: (a) Under the ecosystem is an unconfined aquifer with depth-to-groundwater fluctuating seasonally and interannually within 30 feet from land surface. (b) Depth-to-groundwater in the shallow aquifer is connected to overlying ecosystem. Pumping predominately occurs in the confined aquifer, but pumping is possible in the shallow aquifer. Bottom: (c) Depth-to-groundwater fluctuations are seasonally and interannually large, however, clay layers in the near surface prolong the ecosystem's connection to groundwater. (d) Groundwater is disconnected from surface water, and any water in the vadose (unsaturated) zone is due to direct recharge from precipitation and indirect recharge under the surface water feature. These areas are not connected to groundwater and typically support species that do not require access to groundwater to survive.

## BEST PRACTICE #2. Characterize Seasonal and Interannual Groundwater Conditions

SGMA requires GSAs to describe current and historical groundwater conditions when identifying GDEs [23 CCR §354.16(g)]. Relying solely on the SGMA benchmark date (January 1, 2015) or any other single point in time to characterize groundwater conditions (e.g., depth-to-groundwater) is inadequate because managing groundwater conditions with data from one time point fails to capture the seasonal and interannual variability typical of California's climate. DWR's Best Management Practices document on water budgets[6] recommends using 10 years of water supply and water budget information to describe how historical conditions have impacted the operation of the basin within sustainable yield, implying that a baseline[7] could be determined based on data between 2005 and 2015. Using this or a similar time period, depending on data availability, is recommended for determining the depth-to-groundwater.

GDEs depend on groundwater levels being close enough to the land surface to interconnect with surface water systems or plant rooting networks. The most practical approach[8] for a GSA to assess whether polygons in the NC dataset are connected to groundwater is to rely on groundwater elevation data. As detailed in TNC's GDE guidance document[4], one of the key factors to consider when mapping GDEs is to contour depth-to-groundwater in the aquifer that is supporting the ecosystem (see Best Practice #5).

Groundwater levels fluctuate over time and space due to California's Mediterranean climate (dry summers and wet winters), climate change (flood and drought years), and subsurface heterogeneity in the subsurface (Figure 3). Many of California's GDEs have adapted to dealing with intermittent periods of water stress, however if these groundwater conditions are prolonged, adverse impacts to GDEs can result. While depth-to-groundwater levels within 30 feet[4] of the land surface are generally accepted as being a proxy for confirming that polygons in the NC dataset are supported by groundwater, it is highly advised that fluctuations in the groundwater regime be characterized to understand the seasonal and interannual groundwater variability in GDEs. Utilizing groundwater data from one point in time can misrepresent groundwater levels required by GDEs, and inadvertently result in adverse impacts to the GDEs. Time series data on groundwater elevations and depths are available on the SGMA Data Viewer[9]. However, if insufficient data are available to describe groundwater conditions within or near polygons from the NC dataset, include those polygons in the GSP until data gaps are reconciled in the monitoring network (see Best Practice #6).

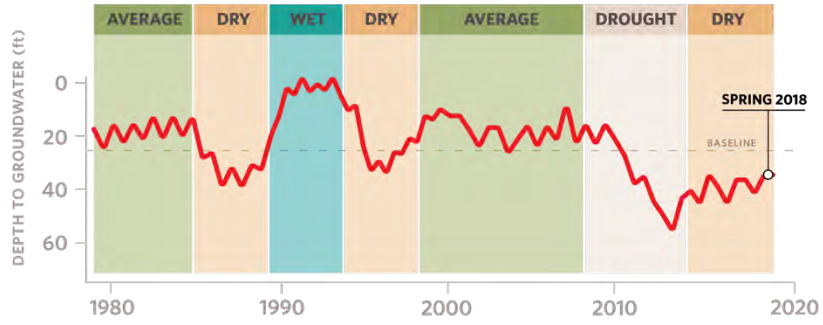



Figure 3. Example seasonality and interannual variability in depth-to-groundwater over time. Selecting one point in time, such as Spring 2018, to characterize groundwater conditions in GDEs fails to capture what groundwater conditions are necessary to maintain the ecosystem status into the future so adverse impacts are avoided.

[6] DWR. 2016. Water Budget Best Management Practice. Available at: https://water.ca.gov/LegacyFiles/groundwater/sgm/pdfs/BMP_Water_Budget_Final_2016-12-23.pdf

[7] Baseline is defined under the GSP regulations as "historic information used to project future conditions for hydrology, water demand, and availability of surface water and to evaluate potential sustainable management practices of a basin." [23 CCR §351(e)]

[8] Groundwater reliance can also be confirmed via stable isotope analysis and geophysical surveys. For more information see The GDE Assessment Toolbox (Appendix IV, GDE Guidance Document for GSPs[4]).

[9] SGMA Data Viewer: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer

## BEST PRACTICE #3. Ecosystems Often Rely on Both Groundwater and Surface Water

GDEs are plants and animals that rely on groundwater for all or some of its water needs, and thus can be supported by multiple water sources. The presence of non-groundwater sources (e.g., surface water, soil moisture in the vadose zone, applied water, treated wastewater effluent, urban stormwater, irrigated return flow) within and around a GDE does not preclude the possibility that it is supported by groundwater, too. SGMA defines GDEs as "ecological communities and species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface" [23 CCR §351(m)]. Hence, depth-to-groundwater data should be used to identify whether NC polygons are supported by groundwater and should be considered GDEs. In addition, SGMA requires that significant and undesirable adverse impacts to beneficial users of surface water be avoided. Beneficial users of surface water include environmental users such as plants or animals[10], which therefore must be considered when developing minimum thresholds for depletions of interconnected surface water.

GSAs are only responsible for impacts to GDEs resulting from groundwater conditions in the basin, so if adverse impacts to GDEs result from the diversion of applied water, treated wastewater, or irrigation return flow away from the GDE, then those impacts will be evaluated by other permitting requirements (e.g., CEQA) and may not be the responsibility of the GSA. However, if adverse impacts occur to the GDE due to changing groundwater conditions resulting from pumping or groundwater management activities, then the GSA would be responsible (Figure 4).

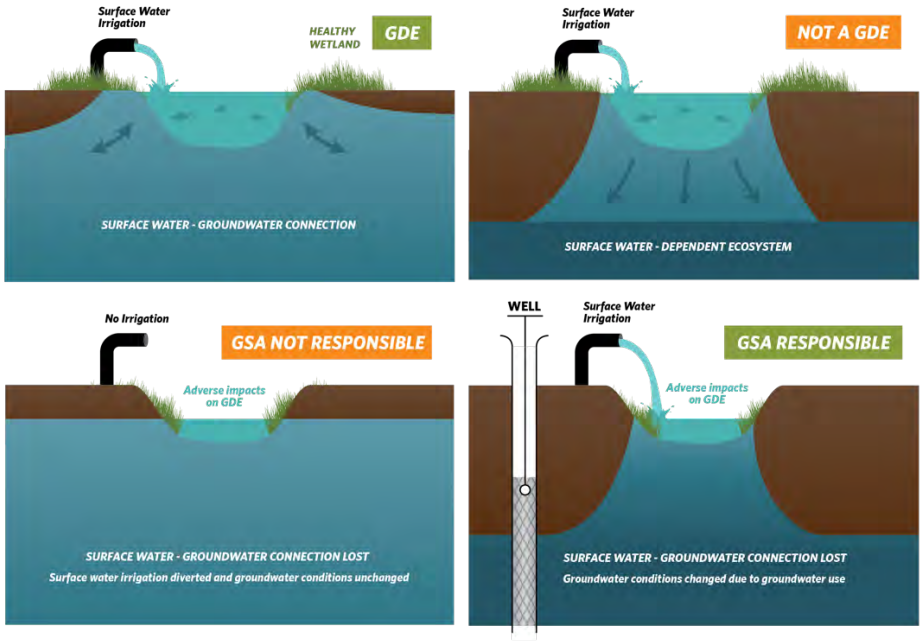



Figure 4. Ecosystems often depend on multiple sources of water. Top: (Left) Surface water and groundwater are interconnected, meaning that the GDE is supported by both groundwater and surface water. (Right) Ecosystems that are only reliant on non-groundwater sources are not groundwater-dependent. Bottom: (Left) An ecosystem that was once dependent on an interconnected surface water, but loses access to groundwater solely due to surface water diversions may not be the GSA's responsibility. (Right) Groundwater dependent ecosystems once dependent on an interconnected surface water system, but loses that access due to groundwater pumping is the GSA's responsibility.

[10] For a list of environmental beneficial users of surface water by basin, visit: https://groundwaterresourcehub.org/gde-tools/environmental-surface-water-beneficiaries/

## BEST PRACTICE #4. Select Representative Groundwater Wells

Identifying GDEs in a basin requires that groundwater conditions are characterized to confirm whether polygons in the NC dataset are supported by the underlying aquifer. To do this, proximate groundwater wells should be identified to characterize groundwater conditions (Figure 5). When selecting representative wells, it is particularly important to consider the subsurface heterogeneity around NC polygons, especially near surface water features where groundwater and surface water interactions occur around heterogeneous stratigraphic units or aquitards formed by fluvial deposits. The following selection criteria can help ensure groundwater levels are representative of conditions within the GDE area:

- Choose wells that are within 5 kilometers (3.1 miles) of each NC Dataset polygons because they are more likely to reflect the local conditions relevant to the ecosystem. If there are no wells within 5km of the center of a NC dataset polygon, then there is insufficient information to remove the polygon based on groundwater depth. Instead, it should be retained as a potential GDE until there are sufficient data to determine whether or not the NC Dataset polygon is supported by groundwater.

- Choose wells that are screened within the surficial unconfined aquifer and capable of measuring the true water table.

- Avoid relying on wells that have insufficient information on the screened well depth interval for excluding GDEs because they could be providing data on the wrong aquifer. This type of well data should not be used to remove any NC polygons.

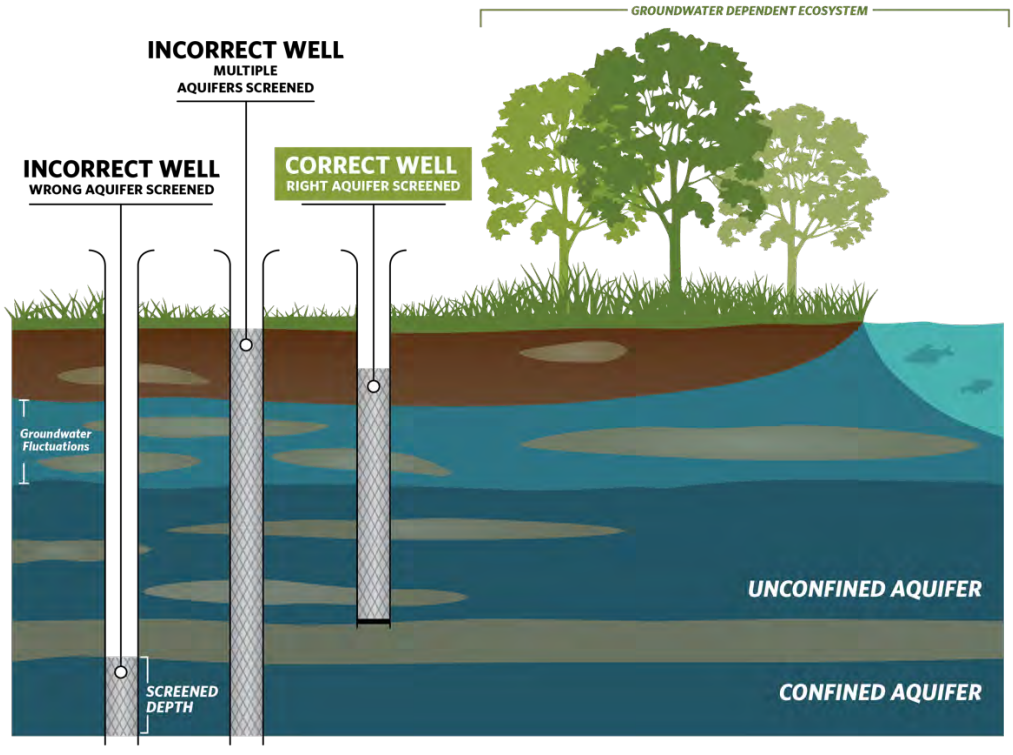



Figure 5. Selecting representative wells to characterize groundwater conditions near GDEs.

## BEST PRACTICE #5. Contouring Groundwater Elevations

The common practice to contour depth-to-groundwater over a large area by interpolating measurements at monitoring wells is unsuitable for assessing whether an ecosystem is supported by groundwater. This practice causes errors when the land surface contains features like stream and wetland depressions because it assumes the land surface is constant across the landscape and depth-to-groundwater is constant below these low-lying areas (Figure 6a). A more accurate approach is to interpolate groundwater elevations at monitoring wells to get groundwater elevation contours across the landscape. This layer can then be subtracted from land surface elevations from a Digital Elevation Model (DEM)[11] to estimate depth-to-groundwater contours across the landscape (Figure b; Figure 7). This will provide a much more accurate contours of depth-to-groundwater along streams and other land surface depressions where GDEs are commonly found.

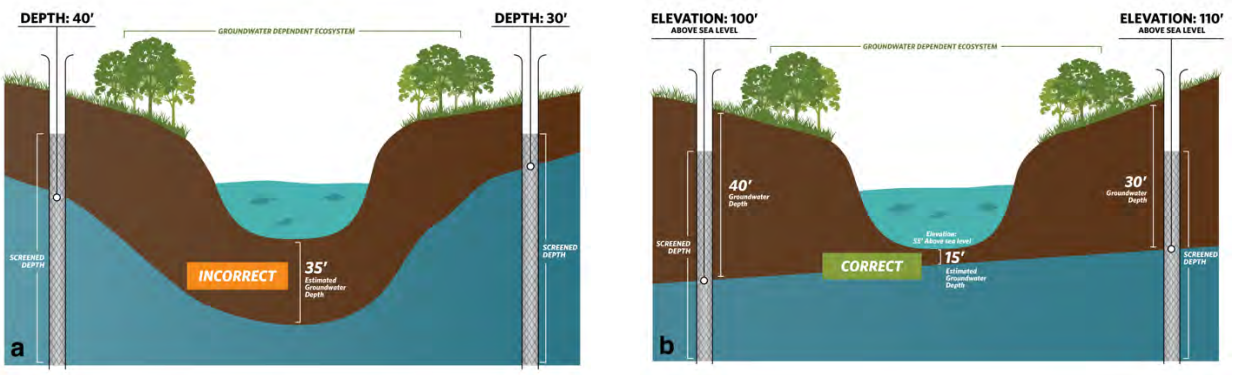



Figure 6. Contouring depth-to-groundwater around surface water features and GDEs. (a) Groundwater level interpolation using depth-to-groundwater data from monitoring wells. (b) Groundwater level interpolation using groundwater elevation data from monitoring wells and DEM data.

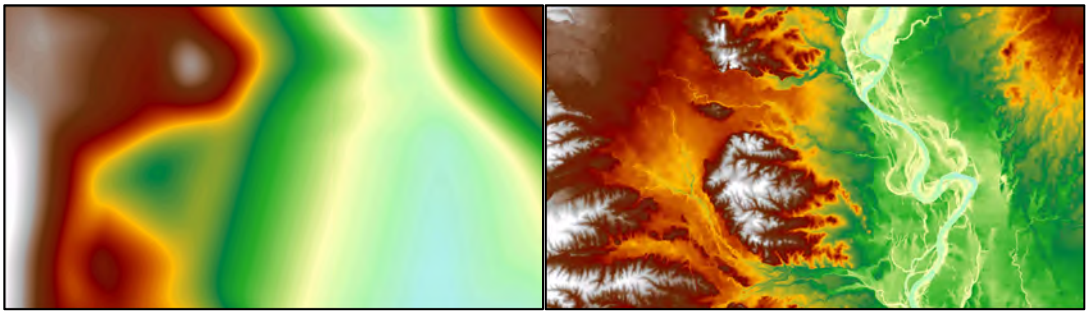


Figure 7. Depth-to-groundwater contours in Northern California. (Left) Contours were interpolated using depth-to-groundwater measurements determined at each well. (Right) Contours were determined by interpolating groundwater elevation measurements at each well and superimposing ground surface elevation from DEM spatial data to generate depth-to-groundwater contours. The image on the right shows a more accurate depth-to-groundwater estimate because it takes the local topography and elevation changes into account.

[11] USGS Digital Elevation Model data products are described at: https://www.usgs.gov/core-science-systems/ngp/3dep/about-3dep-products-services and can be downloaded at: https://iewer.nationalmap.gov/basic/

## BEST PRACTICE #6. Best Available Science

Adaptive management is embedded within SGMA and provides a process to work toward sustainability over time by beginning with the best available information to make initial decisions, monitoring the results of those decisions, and using the data collected through monitoring programs to revise decisions in the future. In many situations, the hydrologic connection of NC dataset polygons will not initially be clearly understood if site-specific groundwater monitoring data are not available. If sufficient data are not available in time for the 2020/2022 plan, The Nature Conservancy strongly advises that questionable polygons from the NC dataset be included in the GSP until data gaps are reconciled in the monitoring network. Erring on the side of caution will help minimize inadvertent impacts to GDEs as a result of groundwater use and management actions during SGMA implementation.

### KEY DEFINITIONS

Groundwater basin is an aquifer or stacked series of aquifers with reasonably well-defined boundaries in a lateral direction, based on features that significantly impede groundwater flow, and a definable bottom. *23 CCR §341(g)(1)*

Groundwater dependent ecosystem (GDE) are ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface. *23 CCR §351(m)*

Interconnected surface water (ISW) surface water that is hydraulically connected at any point by a continuous saturated zone to the underlying aquifer and the overlying surface water is not completely depleted. *23 CCR §351(o)*

Principal aquifers are aquifers or aquifer systems that store, transmit, and yield significant or economic quantities of groundwater to wells, springs, or surface water systems. *23 CCR §351(aa)*

### ABOUT US

The Nature Conservancy is a science-based nonprofit organization whose mission is *to conserve the lands and waters on which all life depends*. To support successful SGMA implementation that meets the future needs of people, the economy, and the environment, TNC has developed tools and resources (www.groundwaterresourcehub.org) intended to reduce costs, shorten timelines, and increase benefits for both people and nature.

# Attachment E

## Maps of representative monitoring sites in relation to key beneficial users

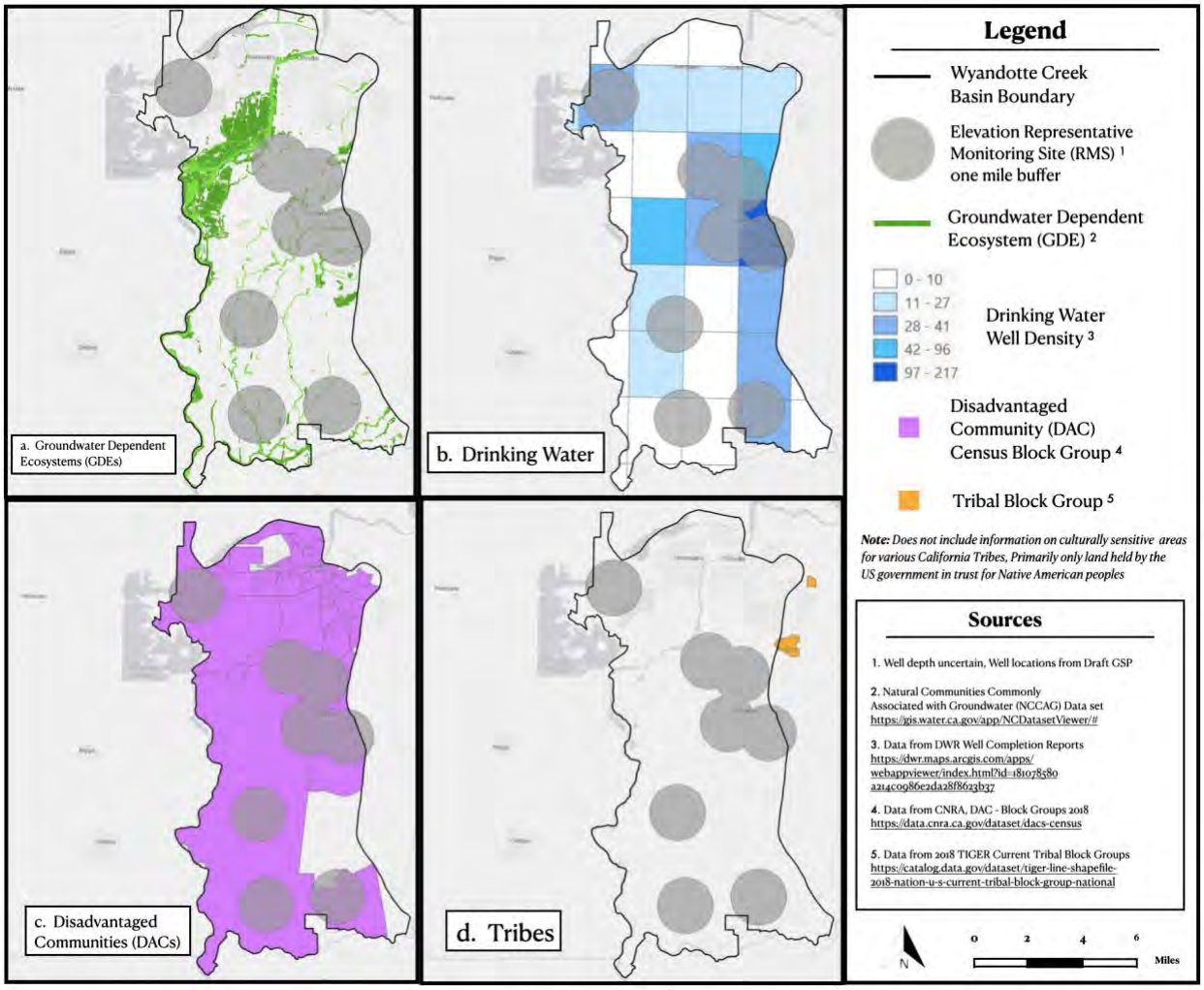



**Figure 1.** Groundwater elevation representative monitoring sites in relation to key beneficial users: a) Groundwater Dependent Ecosystems (GDEs), b) Drinking Water users, c) Disadvantaged Communities (DACs), and d) Tribes.

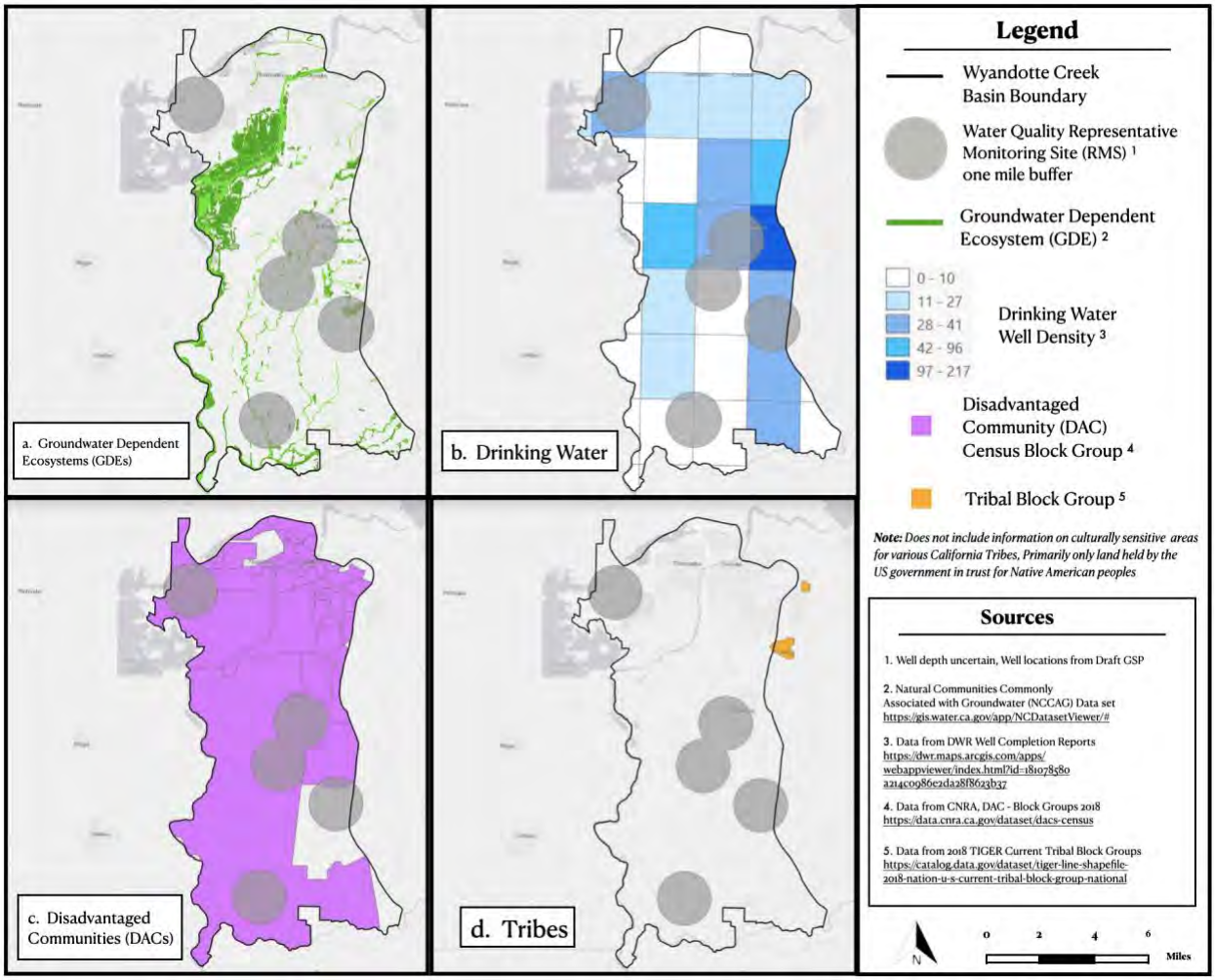



**Figure 2.** Groundwater quality representative monitoring sites in relation to key beneficial users: a) Groundwater Dependent Ecosystems (GDEs), b) Drinking Water users, c) Disadvantaged Communities (DACs), and d) Tribes.

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***GAVIN NEWSOM, Governor***
***CHARLTON H. BONHAM, Director***

WC Draft GSP
Letter A2

October 7, 2021

Butte County Department of Water & Resource Conservation
Wyandotte Creek Subbasin
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Email: wyandotteGSA@buttebasingroundwater.org

**Subject: COMMENTS ON THE WYANDOTTE CREEK SUBBASIN DRAFT GROUNDWATER SUSTAINABILITY PLAN**

The California Department of Fish and Wildlife's (Department) North Central Region is providing comments on the Wyandotte Creek Subbasin Draft Groundwater Sustainability Plan (GSP) prepared by the Wyandotte Creek Groundwater Sustainability Agency (GSA) pursuant to the Sustainable Groundwater Management Act (SGMA).

As trustee agency for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species (Fish & Game Code §§ 711.7 and 1802).

Development and implementation of GSPs under SGMA represents a new era of California groundwater management. The Department has an interest in the sustainable management of groundwater, as many sensitive ecosystems and species depend on groundwater and interconnected surface waters, including ecosystems on Department-owned and -managed lands within SGMA-regulated basins.

SGMA and its implementing regulations afford ecosystems and species specific statutory and regulatory consideration, including the following as pertinent to Groundwater Sustainability Plans:

- GSPs must **consider impacts to groundwater dependent ecosystems** (GDEs) (Water Code § 10727.4(l); see also 23 CCR § 354.16(g));
- GSPs must consider the interests of all beneficial uses and users of groundwater, including environmental users of groundwater (Water Code § 10723.2) and GSPs must **identify and consider potential effects on all beneficial uses and users of groundwater** (23 CCR §§ 354.10(a), 354.26(b)(3), 354.28(b)(4), 354.34(b)(2), and 354.34(f)(3));
- GSPs must **establish sustainable management criteria that avoid undesirable results** within 20 years of the applicable statutory deadline, including **depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water** (23 CCR § 354.22 *et seq*. and Water Code §§

10721(x)(6) and 10727.2(b)) and describe monitoring networks that can identify adverse impacts to beneficial uses of interconnected surface waters (23 CCR § 354.34(c)(6)(D)); and

- GSPs must **account for groundwater extraction for all water use sectors,** including managed wetlands, managed recharge, and native vegetation (23 CCR §§ 351(al) and 354.18(b)(3)).

Furthermore, the Public Trust Doctrine imposes a related but distinct obligation to consider how groundwater management affects public trust resources, including navigable surface waters and fisheries. Groundwater hydrologically connected to navigable surface waters and surface waters tributary to navigable surface waters are also subject to the Public Trust Doctrine to the extent that groundwater extractions or diversions affect or may affect public trust uses (Environmental Law Foundation v. State Water Resources Control Board (2018), 26 Cal. App. 5th 844). Accordingly, groundwater plans should consider potential impacts to and appropriate protections for navigable interconnected surface waters and their tributaries, and interconnected surface waters that support fisheries, including the level of groundwater contribution to those waters.

In the context of SGMA statutes and regulations, and Public Trust Doctrine considerations, the Department values SGMA groundwater planning that carefully considers and protects groundwater dependent ecosystems (GDEs) and fish and wildlife beneficial uses and users of groundwater and interconnected surface waters.

**COMMENT OVERVIEW**

The Department is writing to support ecosystem preservation in compliance with SGMA and its implementing regulations based on Department expertise and best available information and science.

The Department recognizes and appreciates the effort of the GSA to characterize subbasin groundwater conditions based on the data available. However, the Department believes the GSP could improve its consideration of environmental users of groundwater and establish more protective management criteria. Accordingly, the Department recommends that the Wyandotte Creek Subbasin GSA address the following comments before submitting the GSP to the Department of Water Resources (DWR).

**COMMENTS AND RECOMMENDATIONS**

The Department comments are as follows:

1. **Comment #1 Groundwater Dependent Ecosystems** (Groundwater Conditions, 2.2.7 Groundwater Dependent Ecosystems; starting page 50): GDE identification, required by 23 CCR § 354.16(g), is based on methods that risk exclusion of ecosystems that may depend on groundwater.

a. *Issues*:

i. "Not Likely a GDE" Area Identification: The methodology used to classify potential GDE areas within the Natural Communities Commonly Associated with Groundwater (NCCAG) dataset primarily involved desktop review of aerial imagery from four drought years: 2007, 2009, 2013, and 2015 (line 1982). Potential GDE areas were classified as "Not Likely a GDE" if the areas were located within 150 feet of perennial surface water supplies, 150 feet of rice fields, 50 feet of other irrigated agriculture, or 150 feet of agricultural-dependent surface waters. This GDE-elimination method may disregard a GDE's adaptability and opportunistic approach to accessing water in which the vegetation may rely on *both* surface water and groundwater between seasons and years. Without additional analysis that compares the potential rooting depths of groundwater dependent vegetation with the depth to groundwater below the ground surface, there is insufficient information to categorize these potential GDE areas as "Not Likely a GDE." The GDE analysis also classifies potential GDEs from the NCCAG dataset as "Not Likely a GDE" if the vegetation "did not indicate surviving conditions" over the four drought years reviewed for the analysis. During drought years, it is likely that GDEs were experiencing adverse impacts due to combined groundwater depletion and reduced surface water availability. For instance, in 2015, groundwater extraction increased to replace more than 70% of lost agricultural water supplies (Lund 2018); additional groundwater pumping during drought years may have lowered the groundwater table below the rooting zone of GDEs that had previously been able to access groundwater, leading to significant impacts or mortality. The GSP states that impacts or minimum threshold exceedances that occur during dry water year types would not constitute an undesirable result (See Comment #2(iv)). It is inappropriate to simultaneously abdicate management responsibility for impacts to groundwater users during dry water year types (see Comment #2(iv)) while at the same time relying on impacts that occurred during drought years to categorize potential GDE areas as "Not Likely a GDE."

ii. Special Status Species: SGMA defines GDEs as ecological communities *or species* that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface [23 CCR § 351 (m)]. The GSP does not identify or discuss species that may be present within the

subbasin that rely on groundwater, groundwater dependent ecosystems, or interconnected surface waters.

iii. Tree Species: In discussing potential impacts of groundwater depletions on GDEs or interconnected surface waters, the GSP refers to "deep-rooted tree species" (lines 168, 3208, 3273). This phrasing is narrow and excludes consideration of all vegetation types that may be groundwater dependent or supported by interconnected surface waters apart from tree species.

b. *Recommendations*:

i. "Not Likely a GDE" Area Identification: To assess potential GDE areas located near surface waters or irrigated areas, the GSP should incorporate a comparison of potential rooting depths with the groundwater surface elevation. Analysis of groundwater surface elevations should include multiple years that are representative of multiple water year types. The GDE analysis as it relates to survivability during drought years should consider the impacts of drought and increased pumping on groundwater elevation and compare those levels to GDE rooting depths. A more robust analysis would also incorporate other metrics of GDE health, including Normalized Difference Vegetation Index (NDVI) to compare between potential GDE areas and known non-groundwater dependent vegetation, rather than simply reviewing aerial imagery for indications of survival. Until sufficient information is presented to support the classification of these areas as "Not Likely a GDE," the areas should be conservatively classified as "Uncertain." The Department appreciates the GSP's acknowledgement that Valley Oak (*Q. lobata*) can access groundwater at a variety of depths and inclusion of areas containing Valley Oak communities as "Likely GDE."

ii. Special Status Species: The Department recommends the GSP include a list of special status species that may be present within the Wyandotte Creek Subbasin and an assessment of each species' likely groundwater dependence. The GSP should also include a spatial assessment of special status species within the subbasin to characterize which surface waters or GDE areas provide these species habitat or forage; this level of GDE-species-relationship assessment enables GSAs to prioritize GDE monitoring and management decisions.

iii. Tree Species: The Department recommends the GSP language referring to "deep-rooted tree species" be updated to be inclusive of groundwater dependent vegetation more broadly.

2. **Comment #2 Sustainable Management Criteria** (Sustainable Management Criteria; 3.3 Groundwater Levels Sustainable Management Criteria, 3.8 Interconnected Surface Water Sustainable Management Criteria; starting page 88): Interconnected surface water (ISW) sustainable management criteria (SMC) is unlikely to protect against undesirable results for groundwater dependent ecosystems and fish and wildlife beneficial uses and users of groundwater and interconnected surface waters.
    a. *Issues*:
        i. Groundwater Level Proxy Metric: The GSP identifies a data gap related to interconnected surface waters within the subbasin and therefore defaults to using groundwater levels as a proxy metric. However, the GSP does not provide evidence that "significant correlation exists between groundwater level elevations" and depletions of interconnected surface waters [23 CCR § 354.36(b)(1)]. The GSP states that there are no multi-completion wells or nested monitoring well sites located within the subbasin to assess vertical groundwater gradients and characterize connectedness between shallower and deeper aquifer zones. While the Department recognizes the lack of available data and uncertainty surrounding aquifer heterogeneity as it relates to vertical conductivity between aquifer zones, if a significant correlation is lacking between the shallower aquifer zones that are likely interconnected with surface waters and deeper zones where pumping occurs and that are monitored for the groundwater level sustainable management criteria (SMCs), use of groundwater levels as a proxy metric for ISW depletions may misinform groundwater management activities and poorly predict instream habitat conditions for fish and wildlife species.
        ii. ISW Framework: The Department acknowledges the GSP's identification of the data gap related to interconnected surface water and appreciates the development of a framework to guide data collection efforts. However, while the ISW Framework identifies the types of measurements and data necessary to better characterize groundwater-surface water interactions within the subbasin, it does not discuss the methods that will be used to identify the number or locations of groundwater monitoring wells or stream gages.
        iii. Minimum Thresholds and Measurable Objectives: Minimum thresholds (MTs) and measurable objectives (MOs) for groundwater levels, and by proxy for depletions of interconnected surface water, are not likely to prevent undesirable results for environmental beneficial uses and users

of groundwater and interconnected surface water, including groundwater dependent ecosystems. For representative monitoring sites, measurable objectives are set to the groundwater level projected to occur in 2030 based on the trendline of historical data; management to this level would result in groundwater levels falling below historic lows for many of the monitoring wells. The interim milestone groundwater elevations for each representative monitoring site (Table 3-1, page 92) outline a continued decline from current groundwater levels as the SGMA implementation period progresses; this continued downward trajectory of long-term groundwater decline is the very trend that SGMA was designed to combat. The GSP states that the year 2030 was chosen due to the assumption that it would take until this date to implement projects and management actions (line 2972). While the Department acknowledges that some planned PMAs involving supply augmentation may require this length of time to implement, other projects or management actions related to conservation could be implemented in a shorter timeframe, allowing the GSAs to establish more protective MOs rather than defaulting to the trend of long-term groundwater decline. MTs for groundwater levels, which the GSP asserts are designed to be protective of domestic wells, are set far below MOs, and would allow groundwater levels to fall significantly before experiencing what the GSP considers an undesirable result. For instance, within the Oroville Management Area, the MT for representative monitoring site 16Q001M is set 48 feet below the MO (Table 3-1). In setting groundwater level SMCs as proxy metrics for the depletion of interconnected surface waters, the GSP fails to analyze or discuss potential impacts of the established criteria on the rate or volume of surface water depletions or on groundwater dependent ecosystems in areas that have historically demonstrated shallow groundwater levels accessible to environmental users. Under the established SMCs that allow for continued groundwater decline from current conditions, the Department expects that fish and wildlife beneficial uses and users of groundwater and interconnected surface waters could lose access to shallow groundwater water supplies and experience significant and unreasonable impacts prior to the minimum thresholds being reached, including decline of GDEs and ISW habitat suitable for cold water fisheries. The established SMCs would allow groundwater levels to drop well below levels that occurred in 2015, which was the second of back-to-back critically dry water years in the

Sacramento Valley during which time vegetated and aquatic GDEs experienced adverse impacts including stressed or dying riparian vegetation, poor instream habitat availability, and increased water temperatures (DFW 2019). The Department does not believe groundwater levels above the proposed minimum thresholds and below the proposed measurable objectives (in the margin of operational flexibility) will allow the basin to achieve sustainability, particularly with respect to avoiding undesirable results for fish and wildlife beneficial uses and users of groundwater and interconnected surface water.

iv. Undesirable Results: The GSP defines an undesirable result for depletions of interconnected surface waters as "avoiding significant and unreasonable depletion of surface water flows caused by groundwater pumping that significantly impacts beneficial uses." Though the GSP includes a list of potential impacts to environmental uses and users as identified by stakeholders (page 97, line 3203), the GSP does not include any discussion or analysis of whether the established SMCs sufficiently avoid these identified potential impacts to GDEs or environmental users of interconnected surface waters. The Feather River supports both fall-run and spring-run Chinook salmon (*O. tshawytscha);* spring-run Chinook are listed as threatened under both the State and Federal Endangered Species Acts. The GSP identifies the Feather River as gaining in all months, with average monthly gains from groundwater contributing approximately 44 cubic feet per second (cfs). The GSP fails to analyze the impacts of continued, long-term groundwater depletion on the Feather River and the associated species impacts that would result from decreased flows and/or increased water temperatures. Additionally, the GSP notes that groundwater levels that fall below the minimum threshold during hydrologically dry or critically dry years are not considered to be an indicator of undesirable results (page 90, line 2947). This means proposed indicators of undesirable results (i.e., SMC) for groundwater levels and depletions of interconnected surface water effectively do not exist for dry water years. This absence of undesirable results indicators for certain water years means beneficial users of groundwater and interconnected surface water may experience significant and unreasonable effects throughout the duration of dry or critical water years before the undesirable results are 'identified' and managed. Accordingly, there is no groundwater management accountability during the most challenging of years for water resource managers and fish and

wildlife beneficial users alike. Moreover, the frequency and intensity of dry water year types is expected to increase in California (Mann & Gleick, 2015), meaning if accepted as is, this GSP would have no groundwater management accountability during increasingly prevalent and challenging periods of dryness without the certainty of subsequent wet periods.

v. SMC Triggers: The GSP states that for the established SMCs, if observed data "trend toward the locally defined MT, this will trigger action on part of the GSAs." It is unclear over what time period data will need to be collected in order to establish a 'trend' toward the SMCs, and what action will be triggered.

b. *Recommendations*:

i. Groundwater Level Proxy Metric: To justify use of groundwater elevations as a proxy metric for depletions of interconnected surface water until additional data can be collected, the GSP should specify how groundwater elevations are significantly correlated to surface water depletions. Alternatively, if groundwater elevation is not a defensible proxy, the GSP should: 1) specify their plans for better approximating the volume and timing of ISW depletions attributable to groundwater extraction [23 CCR § 354.28(c)(1)] using the anticipated data collection that will fill the ISW data gap (See Comment #5); and 2) select more conservative interim SMC to protect ISW until such time as more information is available.

ii. ISW Framework: The Department recommends that the GSP identify discrete timing and locations for planned groundwater and streamflow monitoring sites as needed to address the identified ISW data gap. Installation of wells and gages and data collection should be completed prior to the first 5-year plan update (See Comment #5).

iii. Minimum Thresholds and Measurable Objectives: The Department recommends the GSP identify representative monitoring sites located near interconnected surface waters and/or groundwater dependent ecosystems and reselect minimum thresholds that would better protect environmental uses and users of groundwater, rather than enabling immense declines in groundwater over the implementation horizon.

iv. Undesirable Results: The Department recommends that the GSP include additional information related to how environmental beneficial users of groundwater may experience the effects of undesirable results. For instance, the GSP should explicitly discuss the relationship between the proxy groundwater level SMCs, modeled monthly depletions of

interconnected surface waters, water temperatures, and the impacts of lowering groundwater levels below historic lows on groundwater dependent ecosystems. The GSP should also identify undesirable results indicators for dry and critically dry water years for all sustainability indicators.

v. SMC Triggers**:** While the Department appreciates that the GSP includes discussion of triggers that will initiate GSA action to avoid reaching minimum thresholds, the Department recommends establishing specific trigger metrics for each sustainability indicator that when reached, would initiate GSA action, and defining the actions to be taken. For environmental users of groundwater, including groundwater dependent ecosystems, triggers should include not only groundwater levels but also physical indicators such as NDVI.

3. **Comment #3 Monitoring Network** (Monitoring Networks, 4.9.1 Groundwater Levels, 4.10 Network Assessments and Improvements; starting page 112): The groundwater level monitoring network may not sufficiently monitor impacts to groundwater dependent ecosystems.
    a. *Issue*: The GSP uses both the groundwater level SMCs and representative monitoring network as a proxy for evaluating impacts to interconnected surface waters and GDEs until additional information can be collected. The GSP primarily considered domestic well protection when establishing SMCs for groundwater levels and selecting representative monitoring sites. It is unclear whether any of the selected groundwater level monitoring wells are located near areas with likely groundwater dependent ecosystems and if plan implementation will involve comparing water depths in representative monitoring sites to the rooting depths of nearby GDE communities.
    b. *Recommendation*: The Department recommends that the GSP assess the groundwater level monitoring network, and by proxy, the monitoring network for interconnected surface waters, for its ability to characterize potential impacts and undesirable results for groundwater dependent ecosystems (See Comment 2(iv)). If wells within the representative monitoring network are not located near identified groundwater dependent ecosystems, a discrete number of groundwater monitoring wells should be installed to capture groundwater trends that would affect priority GDEs. Additional analysis related to the locations of special status species within the subbasin and the groundwater dependent ecosystems that support them can be used to prioritize areas for increased monitoring (See Comment 1(ii)).

4. **Comment #4 Project and Management Actions** (Project and Management Actions; 5.2.2 Project Implementation; starting page 118): Project and management actions (PMAs) may not be sufficient to achieve sustainability, and timelines for pursuing additional PMAs are needed.
    a. *Issue*: The Department recognizes that the GSP identifies Potential Projects that are in the planning phase and may be implemented in addition to the four Planned Projects if necessary to achieve sustainability in the subbasin. However, the GSP fails to identify specific metrics or timelines that would trigger the implementation of additional PMAs if unexpected delays occur, or if the Planned Projects fail to yield the projected benefits to the subbasin.
    b. *Recommendation*: The GSP should include details on specific metrics, targets, and timelines that if not reached with implementation of the planned PMAs will trigger the implementation of additional PMAs. The Department recommends identifying the projects, including those aimed at reducing demand through conservation, that could be implemented on short timescales if needed for the subbasin to achieve sustainability.

5. **Comment # 5 Interconnected Surface Water Data Gap** (Plan Implementation; 6.3 Schedule for Implementation; starting page 146): A more detailed time schedule for collecting additional data and revising the sustainable management criteria for depletion of interconnected surface water is needed.
    a. *Issue*: The GSP identifies information related to the depletion of interconnected surface water as a data gap, and the plan proposes a framework to collect additional information needed to revise the ISW SMCs. The GSP states that "an aggressive schedule" has been provided to fill the data gap in Section 6 (line 3282. However, during Department review, no time schedule related to the ISW Framework or data gap filling effort could be identified. No discrete time schedule is provided for installation of necessary groundwater wells and stream gages, refinement of the characterization of interconnected surface waters within the subbasin, and updates to the SMCs.
    b. *Recommendation*: The GSP should include a detailed time schedule for completing each action as outlined in the ISW SMC Framework to characterize interconnected surface waters in the subbasin and establish appropriate SMCs. The ISW SMC Framework should be completed prior to the first 5-year plan update so that management criteria can be effectively established to protect environmental users of groundwater and interconnected surface waters throughout the implementation period.

**CONCLUSION**

In conclusion, though the draft GSP accurately identifies the need to improve monitoring of shallow groundwater and interconnected surface water systems, the GSP lacks a robust analysis of potential impacts to environmental beneficial users and should establish more protective management criteria. The Department recommends that the Wyandotte Creek Subbasin GSA address the above comments before GSP submission to DWR to best prepare for the following regulatory criteria for plan evaluation:

1. The assumptions, criteria, findings, and objectives, including the sustainability goal, undesirable results, minimum thresholds, measurable objectives, and interim milestones are not reasonable and/or not supported by the best available information and best available science. [23 CCR § 355.4(b)(1)] (See Comments #1, 2, 3)
2. The GSP does not identify reasonable measures and schedules to eliminate data gaps. [23 CCR § 355.4(b)(2)] (See Comments #3, 5)
3. 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 not been considered. [23 CCR § 355.4(b)(4)] (See Comments #1, 2, 3)
4. The projects and management actions are not feasible and/or not likely to prevent undesirable results and ensure that the basin is operated within its sustainable yield. [23 CCR § 355.4(b)(5)] (See Comment #4)

The Department appreciates the opportunity to provide comments on the Wyandotte Creek Subbasin Draft GSP. Please contact Bridget Gibbons, Environmental Scientist, by email at Bridget.Gibbons@wildlife.ca.gov with any questions.

Sincerely,

DocuSigned by:
Jennifer Garcia
B35A7660DD7848B...

Kevin Thomas
Regional Manager, North Central Region

Enclosures (Literature Cited)

ec:

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**Literature Cited**

Department of Fish and Wildlife. 2019. Statewide Drought Response: Stressor Monitoring.

Lund, Jay, et al. Lessons from California's 2012-2016 Drought. 2018. *Journal of Water Resources Planning and Management*. *144*(10). https://doi.org/10.1061/(ASCE)WR.1943-5452.0000984

Mann, Michael E. & Gleick, Peter H. 2015. Climate change and California drought in the 21st century. *Proceedings of the National Academy of Sciences of the United States of America*. *112*(13): 3858-3859.

WY Draft GSP
Letter A3

Audubon | CALIFORNIA

October 24, 2021

Butte County Department of Water & Resource Conservation
RE: Wyandotte Creek Subbasin GSP
308 Nelson Avenue
Oroville, CA 95965

*Sent via email to*: WyandotteGSA@gmail.com

Re: Comments on the Draft Groundwater Sustainability Plan for the Wyandotte Creek Subbasin Groundwater Sustainability Agency

To Wyandotte Creek Subbasin Groundwater Sustainability Agency,

Audubon California appreciates the opportunity to provide public comment on the draft Groundwater Sustainability Plan (GSP) for the Wyandotte Creek Subbasin Groundwater Sustainability Agency (GSA). Audubon California is a statewide nonprofit organization with a mission to protect birds and the places they need. Our organization has a long history of solutions-focused work in the Central Valley in collaboration with state and federal agencies, water districts, non-profits, and landowners. Audubon is reviewing draft GSPs as a stakeholder for the environment with a particular focus on managed wetlands. We are commenting on draft GSPs to provide technical assistance to Groundwater Sustainability Agencies (GSAs) to improve their GSPs prior to their final submission to the Department of Water Resources in January 2022. Audubon would also like to identify areas of opportunity to partner with landowners and GSAs to provide groundwater and wildlife habitat benefits in the implementation of the Sustainable Groundwater Management Act (SGMA).

Over 90 percent of historic wetlands in the Central Valley have been replaced with agriculture or urban development. Disconnected from natural water sources as a consequence of surface water diversions and groundwater over-pumping, wetland landowners must utilize surface water deliveries or pump groundwater to provide flooded habitat. But managed wetlands provide outsized public trust benefits for their minor water use.

The remaining wetlands in the Central Valley are a critical component of the Pacific Flyway, supporting millions of migratory waterfowl, hundreds of thousands of shorebirds, and state listed species like the Tricolored Blackbird. Central Valley managed wetlands are part of California's commitment to national and international Pacific Flyway agreements and provide significant public trust benefits, including habitat for migratory birds, recharge of overdrafted aquifers, carbon sequestration, and recreation opportunities for birders, hunters, and disadvantaged communities.

Managed wetlands require specific consideration in GSPs under SGMA statute and regulations, as detailed below. GSAs are required to identify managed wetlands as beneficial users of groundwater and as land uses and property interests and should recognize this land use consistent with other active users of surface and groundwater. The overall basin water budget must include managed wetlands as a specific water use sector and the GSP is required to consider the effects of the GSP on managed wetlands as a beneficial user or land use.

When GSPs fail to adequately consider the water needs and recharge contributions of managed wetlands, projects and management actions may ignore managed wetlands, their need for protection as public trust resources, and their potential to be part of sustainability solutions. If future actions include groundwater allocations, managed wetlands face the potential of being excluded if not recognized in the GSP, risking further loss in critical wetland acreage.

**SGMA Requirements Related to Managed Wetlands**

A primary requirement for GSAs during GSP development is the consideration of the interests of "all beneficial uses and users of groundwater" [Water Code Section 10723.2], which includes "[e]nvironmental users of groundwater" [Water Code Section 10723.2(e)].

Articulated into the SGMA regulations, the concept of beneficial uses and users of groundwater is first represented in CCR, Title 23, Section 354.10. Notice and Communication, which directs the GSP to "…include a summary of information relating to notification and communication by the Agency with other agencies and interested parties including the following: (a) A description of the beneficial uses and users of groundwater in the basin, including the land uses and property interests potentially affected by the use of groundwater in the basin, the types of parties representing those interests, and the nature of consultation with those parties." [emphasis added].

Furthermore, the SGMA regulations provide a definition that explicitly includes managed wetlands as a beneficial user where:

> "'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." CCR, Title 23, Section 351(al) [emphasis added].

GSAs are then directed to include all water user sectors in the description of the GSP area and to quantify groundwater use by these sectors in the historic, current and projected budgets [emphasis added]:

> CCR §354.8. Description of Plan Area: Each Plan shall include a description of the geographic areas covered, including the following information:
>
> (a) One or more maps of the basin that depict the following, as applicable:
>
> (4) Existing land use designations and the identification of water use sector and water source type.
>
> and,
>
> CCR §354.18. Water Budget:
>
> (b) 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.

Given these explicit requirements, GSAs are required to identify and map managed wetlands and include their water needs in water budgets in the GSP.

Furthermore, each GSP is also required to describe "undesirable results" where such included:

> "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." CCR, Title 23, Section 354.26(b)(3) [emphasis added]

**Comment Overview**

GSAs are required to consider public trust resources in their GSPs, including managed wetlands. In reviewing this draft GSP, we see the GSA is working hard to minimize the impacts to its growers in the subbasin. It is essential these efforts also include the managed wetlands. As beneficial users of water, these habitats provide essential waterbird food and critical habitat, often requiring the application of surface or groundwater similar to cropped lands.

While the Butte Basin Groundwater Model (BBGM) used to prepare historic, current and future water budgets includes reference to managed wetlands acreage and demand (a draft version of the BBGM model documentation, as provided in October 2021, was reviewed), it did not readily present the input assumptions regarding managed wetland acres to allow assessment of whether all managed wetlands are included – state, federal, and private.

This is most prominently represented in Figure 1-6 through Figure 1-8 where the GSP represents lands uses and ownership. Managed wetlands are not designated as a "crop type" or "land use" in the first two figures, and the representation of state and federal lands reflects only those lands owned by state or federal agencies, missing private wetlands. Absent additional explanation in the GSP or the BBGM to assess the acres represented as managed wetlands, Audubon is concerned the GSP underrepresents this important land use. Further clarification, including a table and/or updated maps, would allow for a better understanding of the GSP's handling of this beneficial user.

Our comments are summarized as follows:

1. Identification of managed wetlands: Audubon appreciates that the GSA has identified and specifically included managed wetlands in maps and water budgets. However, we note two concerns:
    a. Significant acreage of lands enrolled in the United States Natural Resource Conservation Service's Wetland Reserve Program (WRP) and represented in DWR's 2016 Statewide Crop Mapping layer seem to be excluded from the mapping and therefore likely from the inputs to the Butte Basin Groundwater model (BBGM), which was used to prepare historic, current and future water budgets (see Figure 2-8).
    b. Details regarding managed wetland acres and assumed evapotranspiration (ET) rates are absent.
2. Water budget: Inclusion of managed wetlands as a specific component of the water budgets (e.g. Table 2-5) is appreciated. While reference is made to the assumptions in the BBGM, review of the BBGM model documentation did not reveal details regarding the assumed managed wetland acres within the Wyandotte Creek subbasin under each water budget nor the assumed ET and related details that would drive the water budget calculations. Furthermore, it is not clear if all managed wetlands, including WRP lands, were included in the BBGM and thus whether water demands for managed wetlands were fully recognized. As such, Audubon is concerned that the future conditions inadequately account for the water needs of managed wetlands.
3. Identification of data gaps: The lack of information regarding the water needs for managed wetlands should be identified as a data gap in the GSP. Specifically, on page 60, the GSP notes

that agricultural demands (including managed wetlands) and groundwater pumping were estimated using the BBGM. But the BBGM indicates ET was determined using remote sensing data and corresponding crop coefficients, but does not list a crop coefficient for managed wetlands. As such, it is unclear whether the appropriate water needs of managed wetlands have been adequately represented in the water budgets. Furthermore, Audubon supports the next steps for the water budget, noted on pages 82-83, and highlight managed wetlands as a water sector that should be included in future refinements of surface water diversions, groundwater pumping, and deep percolation.

4. Consideration of managed wetlands: While managed wetlands are appropriately included in the GSP separate from groundwater dependent ecosystems, there seems to be limited discussion about the role managed wetlands have as part of projects and management action solutions. For instance, managed wetlands provide opportunities for multi-benefit recharge and should be part of discussions about FloodMAR programs.

**Draft Groundwater Sustainability Plan Page-by-Page Comments**

Additional page-by-page comments on the GSA's draft GSP are detailed below. We welcome any follow up questions and look forward to seeing the issues raised below addressed in the final GSP submission in January 2022.

Figure 1-6: Land use map should also show the location of managed wetlands.

Figure 1-7: Crop type should include managed wetlands.

Figure 1-8: Private lands with state or federal easements, such as the NRCS Wetland Reserve Program, should be included.

P. 21: Does the category "surface water users" include any managed wetlands that apply surface water to meet the managed wetland water needs or are managed wetlands only included in the category "environmental users of groundwater"?

P. 54: The category "Not Likely a GDE Due to Supplemental Water Supplies" indicates a determination was made for managed wetlands that rely on supplemental water to meet applied water needs. Elsewhere in the GSP, information regarding whether this supplemental water is pumped groundwater or applied surface water is lacking (see related comment for page 21). Additional details regarding the managed wetland acres, applied water needs, and water sources should be referenced. As noted previously in this comment letter, review of the BBGM indicates the information is not clearly documented in this referenced document either.

P. 59, Table 2-4: Why were surface water diversions for the current condition baseline water budget limited to 2015 and 2016? These years reflect low surface water availability due to drought constraints and State Water Resources Control Board imposed water right curtailments. For managed wetlands that may rely on surface water, this would be a misrepresentation of long term needs. Since the current condition assumptions regarding water supplies are carried forward to the future conditions, the potential misrepresentation of managed wetland water supplies due to limiting to 2015 and 2016 may incorrectly affect future water budgets and results.

P. 60: The bullets explaining the water budget procedures do not provide the necessary details regarding assumptions specifically made for managed wetlands. For instance, groundwater

pumping is estimated by estimating total demand then subtracting applied surface water quantities – referencing the BBGM as the source document for the assumptions. Upon reviewing the BBGM draft documentation, the details regarding these assumptions are also not provided so it is unclear what assumptions were made to calculate managed wetland demands and what surface water quantities were available. There needs to be improved documentation in the BBGM if it is a primary source for the water budgets presented in the GSP.

P. 67: The GSP notes that evapotranspiration (ET) is from several beneficial uses, including managed wetlands. However, details regarding the ET assumptions for managed wetlands are lacking. These special habitats can have several different water needs depending on how they are managed and the target species they are intended to benefit (e.g. fall flood up for habitat versus spring irrigation for feed). This same statement is repeated for each water budget condition on subsequent pages in the GSP (e.g. future conditions). This comment applies to each water budget.

P. 82, Recommended Next Steps: Efforts should be made to refine managed wetland water needs in the next steps taken in the water budget development.

P. 126, Flood MAR: Please include Audubon as a participant in planning efforts for recharge opportunities. Managed wetlands can provide unique opportunities to create recharge and habitat benefits.

Thank you for your consideration of Audubon California's comments. If you would like to discuss this matter further, please do not hesitate to contact me at (916) 737-5707 or via email at samantha.arthur@audubon.org.

Sincerely,

Samantha Arthur
Working Lands Program Director
Audubon California

**Loeser, Kamie**

**From:** Tasha Levinson <tdian@sbcglobal.net>
**Sent:** Saturday, September 25, 2021 7:39 PM
**To:** Willam Bynum; Buck, Christina; Peterson, Kelly
**Subject:** Comments to Wyandotte Creek GSP



Thank you to Bill Bynum, who allowed me to review the Wyandotte Creek GSP, and thank you to Christina Buck and Kelly Peterson, who did such an excellent job that I feel vastly more informed than I had been.
My comments are lengthy and range from typos, to thoughts that came to mind as I was reading, to concerns about the plan itself. I will try to reference comments by line number, or if that is not applicable, by page (p), figure (f) or table (t).

p. xii - add definition of LUST (fES-4 and 1727)
202-209 - while by reading the GSP I now understand that the MO intentionally was set at lower than "current condition", I still believe that since the intent is to "sustain what we have", that objective should not be lower than our current condition.
tES-1 - I would add and asterisk by the second to last well (16C001M) to note that it is the well depicted in fES-6 and fES-7)
fES-7 - please include the keys for the yellow and grey lines (or delete them from the table). Is year 49 an estimate for 2019 based on data from the year 2004? If so, I think a note to that effect should be included on line 307.
tES-1 - it would be great if you used the entire well numbers showing on fES-9 (or include a note letting the reader know to look for the last 7 characters of the well name when locating these wells on fES-9 -- also, why are the Cal Water Service wells not depicted on fES-9?)
f1-5 - I could not understand the key and certainly had no idea which areas are severely disadvantaged (unless, that is the point: the entire area is severely disadvantaged, it is just that the data came from different sources).
f1-9 thru f1-12 - all show a blank white space in the southeast corner; is that an area of no wells or of no data? Personally, I found the breakdown of separate figures for types of wells, each with its own key for well density, to be more confusing than helpful, but do not have a suggestion for clearer presentation.
651 - it would be more accurate to say, "Cal Water Service supplies water for residential and municipal use (a portion of which comes from groundwater)"
707-711 - it may also be appropriate to note that the fires destroyed many areas that normally obtain snow-pack and destroyed many areas that operate as a watershed for the snow-pack to gradually recharge surface and groundwater systems, and to note that climate change has increased temperatures so that evaporation losses will be greater than we ever have seen, and to note that the reservoir at Lake Oroville has been reduced by the accelerated impact of climate change to a mere puddle.
741, and 758-760 - each of these points reflect the concern to retain Butte County water for Butte County uses. While not directly relevant, this is the concern about the Tuscan Water District proposal (which would put control of a portion of the water impacting our area in the hands of non-local owners).
831 - I read about Cal Water's 3 wells, are there actually 4 and where is the 4th well.

877-8 - Cal Water's high water rates are difficult for both our immediate and long term financial viability (and, yes, they are aware that this is one of my continuing concerns).
above 907 - somewhere we might want to note that there is an ongoing problem related to quantity and quality of surface and groundwater due to numerous marijuana grows that have tended to operate under-the-radar and hence avoiding monitoring and/or regulation.
1168 - should "Cal Water Chico" read "Cal Water Oroville"?
1287-1290 - as most residents have heard only of the Tuscan formation, I believe mention of it should be included along with the references to Laguna and Ione.
1299 - I believe that the first sentence should read something like, :The Wyandotte Creek Subbasin lies southwest of the Oroville Reservoir (which is operated by license to DWR that significantly manages it for the benefit of Southern California contractors, in addition to providing local flood control and local recreational and environmental management)." Otherwise, anyone reading the report might believe that the reservoir is operated as a water-resource for our benefit.
f2-7 - I could not locate the Tuscan/Mehrten formation areas on your map (based on the description 1371-1374 on the prior page, I thought I should be able to find them).
1472-1474 - reading this, I assume that water from the principal aquifer is not used for agriculture; am I correct?
1538-1539 - sentence is not complete.
1540 - change the period to a colon to have this work.
f2-9 thru f2-12, include the date as part of the large type caption to make these easier to understand (e.g., f2-9 would read "WATER SURFACE ELEVATION Spring 2015")
f2-13 and f2-14 - where is the well shown in tES-1 as 16C001M?
1669-1670 - I believe these color-coding descriptions should be moved to be part of the f2-15 description. Also, somewhere note must be made that f2-15 ends at 2018 just before we entered the current drought and that, accelerating impacts of climate change are causing historic changes to the area (e.g., Oroville Reservoir is now a mud-puddle).
below 1728, I did not see mention of the Coppers site, nor did I see mention of the area portion of South Oroville that was used for Paradise fire clean-up.
t2-3 - is DWR spillway discharge subtracted from these figures or somehow accounted for in a way that the data is useful?
2066-2070 - it is my understanding that as part of Oroville's annexation of the Ruddy Creek area, an entire valley oak GDE will be eliminated if it has not already been done.
2103 - I question the use of 2004-5 (relatively normal years) to complete your time-span; I believe it would be more appropriate to use dry or critical years.
f2-25 - I observed what seems to be to be a noteworthy decrease in wet and above-normal years. That supports my concern that we look for a MO that is not below current conditions so that we truly are seeking to sustain what we have now, particularly considering how we all have been caught un-prepared by the accelerating impacts of climate change.
t2-5 and t2-6 - please see my comments above. I do believe your rainfall and evaporation predictions must be adjusted to reflect the problems we actually are facing. Also, I keep hearing about large diameter deep wells in Glenn County that may be draining our shared aquifer beyond any sustainability right now.
f2-26 through f2-35 - I found myself bounding back and forth from page to page, trying to mentally adjust for scale differences, trying to guess color-keys, etc., so that the substance was lost. My guess is that if you combine all of the figures for "land surface" and all of those for "groundwater" so that each can work off the same scale and color keys and allow the reader to compare historic, current, and projected data, this information would be very useful.
2412-2418 - given what has happened to Lake Oroville, I not sure there will be much stability to the Feather River in the future.
t2-9 - I have no idea what you are trying to tell me.

2753 - notes that the MT is described as a point where "undesirable results may begin to occur," Yet the MT the GSP sets is one where they already have started to occur.
2894-5 (and each place the same approach is applied): I continue to believe that requiring 2 RMS wells in each management area reach the MT for 2 consecutive non-dry years, sets the bar so low that we will be beyond help before we can get outside help. Given how few RMS wells we have, any 2 wells for the entire subbasin would make more sense. Also, the entire GSP reflects that we seem to have more-and-more dry years so that it is not clear to me that the stated standard ever can work.
2902-2903 - I read this to say that allowing domestic wells and other groundwater users to have their wells run dry is not an "Undesirable Result" -- do you really want our GSP to say this?
3219-3230 - Since DWR's license renewal to operate Oroville Dam has been held up for 15+ years awaiting a fish/wildlife study that finally was completed about 2 years ago, there should be something fairly recent that will fill much of this data gap.
f4-1 - please label the wells to match up to t4-1.
3531 - reference should be to Figure 4-3 (not 4-4).
Finally, from some of the many water meetings I have attended, I believe that if project 5.2.6.1 could be converted to permit the treated water in Thermalito's evaporation tanks to recharge Oroville's wildlife area that might solve Supervisor Connelly's injection concerns and put that water to good use in a relatively economical way. Also, a project to get 2,500 gallon storage tanks to well-dependent residences might be a very good thing for our area.

Again, I found this so informative and helpful! So sorry if it provoked too many thoughts. Thank you for such excellent work! Tasha

WC Draft GSP
Letter PC2

September 12, 2021

PUBLIC DRAFT FINAL Groundwater Sustainability Plan Wyandotte Creek Groundwater Subbasin

Public Comments Final

Draft pointsI seek to address are color highlighted.

The current Final Draft wordings are in Green, my comments are in Red and resource info I want to share is in Blue

I believe data gaps need to be addressed in this final draft.

125 stable, maintaining this posture in the future may become less the result of a state of nature and

126 more the reward for thoughtful management. The use of the word 'thoughtful' could be stronger as thoughts vary and are not always cooperated on. I think it should read well planned, up to date and cooperative management. (up to date is important as using old or incomplete data, outdated mindsets is an issue.

153 are already dry are not considered interconnected surface water. However, the upland streams are
154 an important source of recharge to the aquifer, so the health of these stream channels The health of the stream channels, this must be addressed as new developments get approved within the Wyandotte Creek GSA sub-basin (specifically one currently approved by the City of Oroville, that plans to alter the streambed and discharge polluted run-off waters into the Ruddy Creek stream.)and their
155 adjacent riparian zones is important to groundwater sustainability. Riparian zones within the Wynadotte Creek sub-basin must have current environmental documentation

This has been identified as a
156 data gap I believe this data gap needs to be addressed now.
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/?cid=nrcs143_014199
What are riparian areas?
Riparian areas are lands that occur along watercourses and water bodies. Typical examples include flood plains and streambanks. They are distinctly different from surrounding lands because of unique soil and vegetation characteristics that are strongly influenced by the presence of water.
Values and functions of riparian areas:
Because of their variation across the country, riparian areas function in different ways. In spite of their differences, all riparian areas possess some similar ecological characteristics such as energy flow, nutrient cycling, water cycling, hydrologic function, and plant and animal population.

and will be addressed as part of the GSP implementation. In what actual time frame will this data gap be addressed and what agency will update and provide this data?
159 water interactions and mapping analysis of Groundwater Dependent Ecosystems (GDEs) "Groundwater supports a variety of ecosystems including springs, rivers, lakes, meadows, and wetlands, as well as trees and shrubs that tap into groundwater through deep roots (called phreatophytes). Many of these groundwater dependent ecosystems (GDEs) have small footprints on the landscape, but outsize ecological, economical, and cultural importance — they provide water storage and purification, store carbon, provide recreational and economic benefits, many of them are considered sacred to indigenous peoples, and they provide habitats to a wealth of species, As water demands for agriculture, mining, energy development, and potable water uses continue to increase, understanding the potential impacts of groundwater withdrawals on these ecosystems can assist efforts to sustainably manage limited water resources to meet economic and livelihood, wildlife habitat, recreation and other needs. Furthermore, understanding the influence of variability in climatic conditions on groundwater dependent vegetation will enhance our ability to better tease apart effects of climate from those associated with water management." https://www.dri.edu/

172 floodplain is dependent on multiple components of the hydrologic cycle that may or may not This wording is too vague as this draft acknowledges there is a dependency.
173 have relationships to groundwater levels in the principal aquifer.
391 The Wyandotte Creek Groundwater Subbasin (Wyandotte Creek Subbasin or Subbasin) has been
392 identified by the DWR as a medium priority basin The draft keeps mentioning the Wyandotte Creek sub-basin is stable
402 In November 1996, the voters in Butte
403 County approved "An Ordinance to Protect the Groundwater Resources in Butte County." One
404 of the stated purposes of the ordinance was that "the groundwater underlying Butte County is a
405 significant water resource which must be reasonably and beneficially used and conserved for the
406 benefit of the overlying land by avoiding extractions which harm the Butte basin aquifers
407 (includes the Wyandotte Creek Subbasin), causing exceedance of the safe yield or a condition of PUBLIC DRAFT FINAL Wyandotte Creek Groundwater Subbasin GSP 2 September 9, 2021 408 overdraft." This vote by the people of Butte County needs to be on the table and addressed by all the GSAs in Butte County including the WCGSA as discussion to form the Tuscan Water District rises up. The GSA are tasked to do this work not a separate "new group."
8 In 2014, the California legislature enacted the Sustainable Groundwater Management Act
9 (SGMA) in response to continued overdraft of California's groundwater resources. SGMA
10 provides for local control of groundwater resources while requiring sustainable management of
11 the state's groundwater basins. Under the provisions of SGMA, local agencies Pay attention to this wording "local agencies", must establish
12 governance of their subbasins by forming Groundwater Sustainability Agencies (GSAs) within
13 the authority to develop, adopt, and implement a Groundwater Sustainability Plan (GSP or Plan)
14 for the subbasin. Under the GSP, GSAs must adequately define and monitor groundwater
15 conditions in the subbasin and establish criteria to maintain or achieve sustainable groundwater
16 management within 20 years of GSP adoption.
29 The purpose of the Agreement was needs to say is to create the Wyandotte Creek GSA to (1) to develop, adopt,
30 and implement a GSP for the Wyandotte Creek subbasin to implement SGMA requirements and
31 achieve the sustainability goals; and (2) involve the public and subbasin stakeholders through
32 outreach and engagement in developing and implementing the GSP. The focus of the Agreement
33 is to maximize local input and decision-making The decision making must be inclusive and a true representation of all local communities, not just the views of the few sitting on the GSA committees or swayed by financial/development interests. WE ALL NEED CLEAN WATER! and address the different water demands and
34 sustainability considerations in the urban and rural areas of the Wyandotte Creek Subbasin. PUBLIC DRAFT FINAL Wyandotte Creek Groundwater Subbasin GSP ES-2 Septmeber typo 9, 2021
35 The agreement also defines two Management Areas (MAs) within the Wyandotte Creek
36 Subbasin: Wyandotte Creek Oroville and Wyandotte Creek South. Management Area refers to
37 an area within a subbasin for which a GSP may identify different minimum thresholds,
38 measurable objectives, monitoring, and projects and actions based on unique local conditions or
39 other circumstances as described in the GSP regulations. The interests and vulnerability we all need WATER this is crucial wording of
40 stakeholders and groundwater uses in these management areas vary based on the nature of the
41 water demand (agricultural, domestic, municipal), numbers and characteristics of wells
42 supplying groundwater, and to some degree the hydrogeology and mix of recharge sources.
43 SGMA requires development of a GSP that achieves groundwater sustainability in the Subbasin
44 by 2042. Butte County needs to aim to reach and apply groundwater sustainability now, not 21 years from now as that may be too late for the health of the aquifers in our county. A pragmatic approach to achieving sustainable groundwater management requires an
45 understanding of (1) historical trends and current groundwater conditions in the subbasin, based
46 on evaluating six sustainability indicators that include groundwater levels, groundwater storage,
47 groundwater quality, land subsidence, depletion of interconnected streams, and seawater
48 intrusion and (2) what must change in the future to ensure sustainability without causing
49 undesirable results (described and defined in Chapter 3) or negatively impacting beneficial uses

50 and users of groundwater, including groundwater dependent ecosystems. This needs more detailed focus in all the GSA reports.

117 Existing Groundwater Conditions
118 Groundwater conditions in the Wyandotte Creek Subbasin are regularly monitored and are
119 described in reports produced by Butte County since 2001. These documents and other reports
120 portray a subbasin that has adequate groundwater resources to meet demands under most
121 hydrologic conditions. However, comparison of the reports illustrates how in the period between
122 their issuance, groundwater conditions have tightened, and as forces ranging from population
123 growth to climate change play out, the value of well-informed water management policies and
124 practices is likely to increase. In short, while groundwater conditions in the Subbasin remain
125 stable, maintaining this posture in the future may become less the result of a state of nature and
126 more the reward for thoughtful management. This need to be worded clearer: "for detailed planning and management."
133 storage was estimated at about 2.1 million-acre-feet (MAF) in 2018. The amount of groundwater
134 in storage has decreased by approximately 0.14 percent per year between 2000 and 2018. As
135 such, it is highly unlikely the Subbasin will experience conditions under which the volume of
136 stored groundwater poses a concern. However, the depth to access that groundwater across the
137 Subbasin may pose a concern. If the deeper wells are required to reach groundwater levels and have high fees, the smaller groundwater uses will be impacted, which is more than poses a concern.
142 Surface waters can be hydraulically interconnected with the groundwater system, where the
143 stream baseflow is either derived from the aquifer (gaining stream) or recharged to the aquifer
144 (losing stream). If the water table beneath the stream lowers as a result of groundwater pumping,
145 the stream may disconnect entirely from the underlying aquifer. Within the floodplain of the
146 Feather River there is a continuous saturated zone that connects the shallowest aquifer to the
147 river. The connectivity between shallow and deeper aquifer zones will dictate the overall
148 connectivity to the River. In the upland areas outside of the Feather River floodplain, there are
149 creeks that flow seasonally and dry up in late summer or are dry for an entire year during dry
150 conditions. Ruddy Creek has been studied and has been determined to be a perennial stream, fed by groundwater. It does not completely dry up and has water in it in the middle of August 2021 in the current extreme drought! The statements included in this draft plan have to be detailed and accurate, not just general statements without current data. In this case, the upland creeks may not be influenced by "high groundwater
151 connectivity" and the presence of an undesirable result is not clear cut with respect to surface
152 water depletion. The streams dry up regardless of the groundwater condition, Ruddy Creek has been studied and has been determined to be a perennial stream, fed by groundwater. It does not completely dry up and has water in it in the middle of August 2021 in the current extreme drought! The statements included in this draft plan have to be detailed and accurate, not just general statements without current data.and streams that
153 are already dry are not considered interconnected surface water. However, the upland streams are
154 an important source of recharge to the aquifer, so the health of these stream channels and their
155 adjacent riparian zones is important to groundwater sustainability. This has been identified as a
156 data gap and will be addressed This data gap must not exist in the draft plan, to really provide part of the GSP implementation.
171 The Wyandotte Creek Subbasin acknowledges that overall function of the riparian zone and
172 floodplain is dependent on multiple components of the hydrologic cycle that may or may not May or may not is a non- statement, the draft must be clearer.
173 have relationships to groundwater levels in the principal aquifer
181 within 20 years. The sustainability goal for the Wyandotte Creek Subbasin is:
182 to ensure that groundwater is managed to provide add the word 'maintain' a water supply of adequate quantity
183 and quality add the word: clean to support beneficial users of groundwater including but not limited to rural
184 areas and other communities, the agricultural economic base of the region, and
185 environmental resource uses add : environmental groundwater dependent ecosystems and habitats, as it is worded it infers only human use. in the Subbasin now and in the future.

193 4. Significant and unreasonable degraded water quality. The development planning to allow subdivision polluted runoff waters to discharge into Ruddy Creek will degrade the groundwater quality within the Wyandotte Groundwater Basin and these very plans drainage plans are currently in process.
271 Data needed to develop the SMCs for interconnected surface waters includes definition of stream
272 reaches and associated priority habitat, streamflow measurements to develop profiles at multiple
273 time periods, and measurements of groundwater levels directly adjacent to stream channels, first
274 water bearing aquifer zone, and deeper aquifer zones. These data are not available and are a data PUBLIC DRAFT FINAL Wyandotte Creek Groundwater Subbasin GSP ES-9 Septmeber 9, 2021 (typo)
275 gap for the GSP. All stream and environmental dependent ecosytem data gaps are unacceptable in these draft reports. The studies need to be required and completed to provide this current information. If not for the environment we would not have a groundwater system to use the water from! Further evaluation of this SMC is needed to avoid undesirable results to aquatic
276 ecosystems and GDEs.

633 Smaller local or ephemeral add: and perennial streams entering and traversing the subbasin include add: Ruddy Creek, North Honcut
634 Creek, Wyandotte Creek, Wyman Ravine and numerous unnamed waterways. If these streams and waterways have a name, the names need to be included in this draft.
659 surface water diversions from the Feather River. SSignificant numbers of rural residents and
660 ranchettes depend on groundwater typically from relatively shallow domestic wells This is why the statements on line 136 &137 are crucial, important and concerning interspersed
661 with agricultural land uses.

747 6. Improve stream bank stability and protect riparian resources. This is an important point that needs to be addressed, considering the current effort to develop within the watershed, wetlands and historic riparian banks of streams within the Wynadotte Creek Sub-basin.

764 • W-P2.9: Applicants for new major development projects, as determined by the 765 Department of Development Services, shall demonstrate adequate water supply to meet 766 the needs of the project, including an evaluation of potential cumulative impacts to
767 surrounding groundwater users and the environment. I do not see this actually happening with current new major developments proposed by the City of Oroville planning dept within Thermalito in the Wyandotte Creek sub-basin.

772 • W-P3.2: Groundwater transfers and substitution programs The point of the GSA is not to arrange groundwater transfers shall be regulated to protect
773 the sustainability of the County's economy, communities and ecosystem, pursuant to
774 Chapter 33 of the Butte County Code.
775 • W-P3.3: The County shall protect groundwater recharge and groundwater quality when
776 considering new development projects. I do not see this happening regarding the stream Ruddy Creek within the Wydandotte Creek Sub-basin.

798 The Oroville City Council adopted the Oroville 2030 General Plan in June 2009. In March 2015,

799 the City Council adopted a targeted update to the 2030 General Plan referred to as the "Oroville 800 Sustainable Code Updates," The maps included with the Oroville General Plan do not show or name streams and creeks.

833 • "South Feather Water and Power Agency supplies water to the eastern and southern 834 portions of the City and SOI." The agency has approximately 171,500-thousand-acre feet 835 of storage capacity "sourced from the South Fork of the Feather River and from the Yuba 836 River system, and is stored in reservoirs at Little Grass Valley, Sly Creek, Lost Creek, 837 Ponderosa, Miner's Ranch, and Lake Wyandotte. South Feather Water and Power 838 Agency delivers approximately 28,000 TAF of water annually and has the capacity to 839 treat approximately 14.5 MGD." The South

Feather Water and Power Agency has four annexation applications currently (Oct 2021 ) before LAFCO to provide potable water in more areas for up to 74+ acres. If approved by LAFCO, the figures in this draft will not be accurate.

867 • Action A6.1: Conduct a study of using reclaimed wastewater for irrigation of public
868 landscaping and for agriculture. This poses an environmental & health issue and potential groundwater contamination.

869 • Policy P8.6: Implement all necessary measures to regulate runoff from urban uses to
870 protect the quality of surface and groundwater. There are plans to drain new development runoff waters into Ruddy Creek within the Wyandotte Groundwater sub-basin, there is no known oversight plan to test or continuously monitor these runoff waters.
884 "Water quality is intimately tied to water supply, since adequate uncontaminated flows
885 significantly mitigate the presence of contaminated flows, through dilution, flushing and general
886 availability of alternate sources." Water quality is more greatly discussed in the Public Safety
887 and Services Element of the General Plan, however, there are still relevant goals, policies, and
888 actions discussed in this element relevant to surface and groundwater.
889 Relevant Goals, Policies, Actions relating to water quality is provided below:
890 • Goal OPS-11: Protect water quality and quantity in creeks, lakes, natural drainages, and
891 groundwater basins. State what agency is going to do this?
892 • Policy P11.1: Maintain the natural condition of waterways and flood plains to ensure
893 adequate groundwater recharge and water supply where feasible, given flood control
894 requirements.
895 • Policy P11.2: Minimize impermeable paving that negatively impacts surface water runoff
896 and groundwater recharge rates.
PUBLIC DRAFT FINAL Wyandotte Creek Groundwater Subbasin GSP 15 September 9, 2021
897 • Policy P11.3: Protect surface and groundwater resources from contamination from runoff
898 containing pollutants and sediment, through implementation of the Central Valley
899 Regional Water Quality Control Board's (CVRWQCB) Best Management Practices.
Can this report state what agency or city, county dept is going to do this?

900 • Action A11.1: Create a comprehensive mapping of groundwater resources in the
901 Planning Area based on existing groundwater management studies and maps and, where
902 necessary, new groundwater mapping studies to result in comprehensive coverage of the
903 Planning Area. Can this report state what agency or city, county dept doing these new studies and where are the reports and what dates were they done?

1129 5. Employ a variety of outreach methods that make public participation accessible and
1130 that encourage broad participation. There need to be more outreach and holding the meetings in the middle of the day limit participation for the working folks. There is no reason not to send an all department announcement to all Butte County staff, to send notices to local colleges and schools, specifically to the environmental departments of the colleges. To share communications with fellow small and large farmers, recreation agencies and water interest public groups and environmental interest groups that most likely would have interest in participating. There are community radio stations that have free community calendar announcement, besides news channels. Information about the GSA planning and meetings need to posted in all 6 Butte County Libraries with advance notice. (not like 2 days before)
1129 5. Employ a variety of outreach methods that make public participation accessible and
1130 that encourage broad participation.
1131 6. Respond to public concerns. If the public offers information, feedback or input it must be valued and not brushed aside or commented on in a biased manner.
1132 7. Provide accurate and up-to-date information. This is exactly why data gaps are not appropriate.
1133 8. Create public value and use GSA resources wisely by managing communications and

1134 engagement in a manner that is resourceful and efficient. Add: and timely, with advance public notifications and board and staff will practice active listening to the public.
1140 Wyandotte Creek Subbasin. Their interest may be related to GSA activities, GSP development
1141 and implementation, and/or water access and management in general .
1144 implementation of the GSP. These include, but are not limited to:
1145 • General public
1146 • Agricultural users of water
1147 • Domestic well owners
1148 • Municipal well operators
1149 • Public water systems
1150 • Land use planning agencies
1151 • Environmental users of groundwater
1152 • Surface water users
1153 • The federal government which Federal agencies? The US Army Corps of Engineers? California Fish and Wildlfie?
1154 • California Native American tribes (which actual tribes for Butte County, CA)
1155 • Disadvantaged communities and historically underrepresented groundwater users
1156 (including those served by private domestic wells or small community water systems).
To really present sustainability goals of this draft: where are the comments and concerns of theses groups from table 1:1
Environmental and Ecosystem groups as the purpose is to create a sustainable plan
21. Regional agencies: Butte County Resource Conservation District
22. Federal and State agencies: CDFW
23. Environmental groups: Butte Environmental Council, The Nature Conservancy
Purpose: Inform and involve to sustain a vital ecosystem
1181 1.8.4.2 Public Engagement Opportunities
1182 There were a number of different meetings at which the public had the opportunity to engage
1183 during the GSP development process: Due to the global Covid pandemic, access for public involvement has been limited especially if one is not computer/internet saavy. As a interested member of the public I suggest paper announcements be posted and outreach be made available at all six Butte County public libraries and CSU and Butte College, Community Centers in all towns and the Oroville Adult Education Center too. A Social Media presence would get the word out as well.

1306 2.1.2.2 Soils

I think it is important to use all data resources to include updated environmental information for this WCGSA draft I have attached documentation to my public comments email that Thompsonflat Oroville Complex and Wilsoncreek Trainer Loam soils are also present within the Wyandotte Creek Groundwater Sub-basin. Please include these soils in this draft. I have attatched reference sources.

1464 2.1.7 Principal Aquifers and Aquitards More detailed information on the aquifers in the Wynadotte Creek subbasin must be included in this draft. Where is the mention of the two aquifers adjacent to Ruddy Creek One that is zero to twenty feet and the other that goes to about 300 feet below ground level? I have attached a document with references.

Do to length of this final draft I will pause here and submit these public comments.

Kathy Brazil

K Brazil, Email, Sun 10/24/2021 9:43 PM

Here are photos taken of Ruddy Creek at Biggs Ave on 0ct 24 2021 I am sending these as public comment for the next WCGSA committee meeting on Nov 4th. Please add these photos as current data for the draft .As the photos show it is a live groundwater dependent ecosystem that is part of recharging the groundwater in the Wyandotte Groundwater Basin.


K Brazil, Email, Sun 10/24/2021 9:43 PM


Sent from my iPad