



State of California – Natural Resources Agency  
DEPARTMENT OF FISH AND WILDLIFE  
South Coast Region  
3883 Ruffin Road  
San Diego, CA 92123  
(858) 467-4201  
[www.wildlife.ca.gov](http://www.wildlife.ca.gov)

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



January 6, 2022

SENT VIA ELECTRONIC MAIL

Ms. Amy Reeh  
General Manager  
Yuima Municipal Water District  
P.O. Box 177  
Pauma Valley, CA 92061-0177  
[gsa@yuimamwd.com](mailto:gsa@yuimamwd.com)

**Subject: California Department of Fish and Wildlife Comments on the Pauma Valley Groundwater Sustainability Agency's Draft Groundwater Sustainability Plan**

Dear Ms. Reeh:

The California Department of Fish and Wildlife (CDFW) appreciates the opportunity to provide comments on the Pauma Valley Groundwater Management Sustainability Agency's (PVGSA) Upper San Luis Rey Groundwater (USLR) Subbasin (Basin) Draft Groundwater Sustainability Plan (Draft GSP) prepared pursuant to the Sustainable Groundwater Management Act (SGMA). The Basin is designated as high priority under SGMA and must be managed under a GSP by January 31, 2022.

CDFW is writing to support ecosystem preservation and enhancement in compliance with SGMA and its implementing regulations based on CDFW expertise and best available information and science. As trustee agency for the State's fish and wildlife resources, CDFW 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 represent a new era of California groundwater management. CDFW has an interest in the sustainable management of groundwater, as many sensitive ecosystems, species, and public trust resources depend on groundwater and interconnected surface waters (ISWs), including ecosystems on CDFW-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 GSPs:

- 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**

Ms. Amy Reeh  
 Pauma Valley Groundwater Management Sustainability Agency  
 January 6, 2022  
 Page 2 of 4

**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(a) 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 surface waters is 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; *National Audubon Society v. Superior Court* (1983), 33 Cal. 3d 419.) The groundwater sustainability agency (GSA) has, “an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible.” (*National Audubon Society, supra*, 33 Cal. 3d at 446.) Accordingly, groundwater plans should consider potential impacts to and appropriate protections for ISWs and their tributaries, and ISWs 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, groundwater planning should carefully consider and protect environmental beneficial uses and users of groundwater, including fish and wildlife and their habitats, GDEs, and ISWs.

The Basin supports both riparian and aquatic habitat. The Basin’s riparian habitat supports several special status species, including the southwestern willow flycatcher (*Empidonax traillii extimus*), least Bell’s vireo (*Vireo belli pusillus*), western spadefoot (*Spea hammondi*), Southern California steelhead (*Oncorhynchus mykiss*), arroyo chub (*Gila orcuttii*), Swainson’s hawk (*Buteo swainsoni*), arroyo toad (*Anaxyrus californicus*), southwestern pond turtle (*Actinemys pallida*), coast horned lizard (*Phrynosoma blainvillii*), California legless lizard (*Anniella pulchra*), California glossy snake (*Arizona elegans occidentalis*), yellow-breasted chat (*Icteria virens*), and yellow warbler (*Setophaga petechia*). Pertaining to the protection of these species and their habitat, CDFW is providing comments regarding GDE monitoring and implementation of management actions to help ensure appropriate consideration and protection of GDEs and beneficial users of groundwater and ISWs. CDFW is providing additional comments and recommendations as notated in Attachment A. Editorial comments or other suggestions are included for PVGSA’s consideration during development of a final GSP.

Ms. Amy Reeh  
Pauma Valley Groundwater Management Sustainability Agency  
January 6, 2022  
Page 3 of 4

If you have any questions related to CDFW's comments and/or recommendations on the Upper San Luis Rey Groundwater Subbasin Draft GSP, please contact Mary Ngo, Senior Environmental Scientist (Specialist), at [Mary.Ngo@wildlife.ca.gov](mailto:Mary.Ngo@wildlife.ca.gov).

Sincerely,

DocuSigned by:  
  
D700B4520375406...

David Mayer  
Environmental Program Manager  
South Coast Region

Enclosure(s): Attachment A, Attachment B

cc: [California Department of Fish and Wildlife](#)

Joshua Grover, Branch Chief  
Water Branch  
[Joshua.Grover@wildlife.ca.gov](mailto:Joshua.Grover@wildlife.ca.gov)

Robert Holmes, Environmental Program Manager  
Statewide Water Planning Program  
[Robert.Holmes@wildlife.ca.gov](mailto:Robert.Holmes@wildlife.ca.gov)

Angela Murvine, Statewide SGMA Coordinator  
Groundwater Program  
[Angela.Murvine@wildlife.ca.gov](mailto:Angela.Murvine@wildlife.ca.gov)

Bryan DeMucha, SGMA Engineering Geologist  
Groundwater Program  
[Bryan.DeMucha@wildlife.ca.gov](mailto:Bryan.DeMucha@wildlife.ca.gov)

David Mayer, Environmental Program Manager  
Habitat Conservation Planning, South Coast Region  
[David.Mayer@wildlife.ca.gov](mailto:David.Mayer@wildlife.ca.gov)

Jennifer Turner, Senior Environmental Scientist, Supervisor  
Habitat Conservation Planning, South Coast Region  
[Jennifer.Turner@wildlife.ca.gov](mailto:Jennifer.Turner@wildlife.ca.gov)

Mary Ngo, Senior Environmental Scientist, Specialist  
Habitat Conservation Planning, South Coast Region  
[Mary.Ngo@wildlife.ca.gov](mailto:Mary.Ngo@wildlife.ca.gov)

Ms. Amy Reeh  
Pauma Valley Groundwater Management Sustainability Agency  
January 6, 2022  
Page 4 of 4

Russ Barabe, Environmental Scientist  
Inland Fisheries, South Coast Region  
[Russell.Barabe@wildlife.ca.gov](mailto:Russell.Barabe@wildlife.ca.gov)

Steve Slack, Environmental Scientist  
Habitat Conservation Planning, South Coast Region  
[Steven.Slack@wildlife.ca.gov](mailto:Steven.Slack@wildlife.ca.gov)

Susan Howell, Staff Services Analyst  
Habitat Conservation Planning, South Coast Region  
[Susan.Howell@wildlife.ca.gov](mailto:Susan.Howell@wildlife.ca.gov)

California Department of Water Resources

Craig Altare, Supervising Engineering Geologist  
Sustainable Groundwater Management Program  
[Craig.Altare@water.ca.gov](mailto:Craig.Altare@water.ca.gov)

National Marine Fisheries Service

Rick Rogers, Fish Biologist  
West Coast Region  
[Rick.Rogers@noaa.gov](mailto:Rick.Rogers@noaa.gov)

State Water Resources Control Board

Natalie Stork, Chief  
Groundwater Management Program  
[Natalie.Stork@waterboards.ca.gov](mailto:Natalie.Stork@waterboards.ca.gov)

**Attachment A***CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE COMMENTS ON THE UPPER SAN LUIS REY GROUNDWATER SUBBASIN DRAFT GROUNDWATER SUSTAINABILITY PLAN***SPECIFIC COMMENTS AND RECOMMENDATIONS**

CDFW's comments are as follows:

**Comment #1 – Assessment of Fish and Wildlife Adjacent to the River (Section 3.3.4.4, Page 3-20):** The Draft GSP does not accurately characterize sensitive fish and wildlife species known to occur in the Upper San Luis Rey River (USLR River).

**Issue #1.1:** CDFW has concerns regarding the limited number of terrestrial and aquatic special-status species that the PVGSA lists in the Draft GSP. The USLR River provides habitat that supports several sensitive species throughout their life cycles, including the federal Endangered Species Act (ESA)-listed and California Endangered Species Act (CESA)- listed southwestern willow flycatcher (*Empidonax traillii extimus*), the ESA- and CESA-listed least Bell's vireo (*Vireo belli pusillus*), the ESA-listed Southern California steelhead (*Oncorhynchus mykiss*; SC steelhead), the CESA-listed Swainson's hawk (*Buteo swainsoni*), and the ESA-listed and CDFW species of special concern (SSC) arroyo toad (*Anaxyrus californicus*) (CNDDDB; CDFW 2021). Additional CDFW SSCs known to occur in the Basin include arroyo chub (*Gila orcuttii*), western spadefoot (*Spea hammondi*), southwestern pond turtle (*Actinemys pallida*), coast horned lizard (*Phrynosoma blainvillii*), California legless lizard (*Anniella pulchra*), California glossy snake (*Arizona elegans occidentalis*), two-striped garter snake (*Thamnophis hammondi*), yellow-breasted chat (*Icteria virens*), and yellow warbler (*Setophaga petechia*) (CNDDDB; CDFW 2021).

These sensitive species above are beneficial users of groundwater dependent ecosystems (GDEs). GDEs and habitat that support these species consist of phreatophytes and other vegetation communities that are dependent on shallow aquifers that support surface water in each of these systems. Phreatophytic vegetation is a critical contributor to nesting and foraging habitat for a wide range of species. These vegetation communities can be affected by depth to groundwater threshold impacts (Froend et al 2010; Naumburg et al 2005). This sensitivity to groundwater level thresholds means that localized pumping and recharge actions altering groundwater levels can impact the health and extent of phreatophytic vegetation health. Both decreasing (drying out) or increasing (drowning) groundwater elevation have the potential to stress phreatophytes depending on the plant species and the groundwater elevation and duration (e.g., short term wetness/dryness versus prolonged wetness/dryness).

The unsustainable use of groundwater can impact species dependent on shallow aquifers and ISWs. This may lead to adverse impacts on fish, wildlife, and the habitat they need to survive. Determining the effects that groundwater levels have on surface water flows in the Basin would provide an understanding of how the groundwater levels may be associated with the health and abundance of riparian vegetation. Poorly managed groundwater pumping, and interconnected surface water flows have the potential to reduce the abundance and quality of riparian vegetation. This reduction also diminishes the amount of shade provided by the vegetation, and ultimately leads to increased water temperatures in the Basin. Some examples of species potentially dependent on GDEs include:

## Attachment A

## Page 2

- The San Luis Rey River represents the southernmost watershed in which arroyo chub are native. Historically, this species was present throughout the watershed but preferred the slower moving sections in the lower elevation sections of the watershed. Significant modifications to the hydrology and the introduction of non-native species have limited the current distribution of this species within the watershed to one short section (O'Brien and Barabe, in press), increasing the potential for a single stochastic event to eradicate the species from one of the seven native watersheds. Groundwater extraction adds another potential impact and must be considered.
- Arroyo toad survival and reproductive success may be particularly susceptible to groundwater pumping. The reproductive success of the arroyo toad is dependent upon suitable breeding pools that must retain water long enough to sustain the development of their egg masses, larvae, and metamorphs (U.S. Fish and Wildlife Service 1999). Groundwater pumping that impairs streamflow could have negative impacts on arroyo toad populations.
- Southwestern pond turtles' preferred habitat is permanent ponds, lakes, streams, or permanent pools along intermittent streams associated with standing and slow-moving water. A potentially important limiting factor for southwestern pond turtle is the relationship between water level and flow in off-channel water bodies, which can both be affected by groundwater pumping.
- If groundwater depletion results in reduced streamflow in areas with interconnected surface waters (ISWs), the nesting and foraging success of southwestern willow flycatcher, least Bell's vireo, and other bird species may be diminished due to the reduced nesting habitat and food availability.

**Recommendation #1.1(a):** To ensure meaningful consideration of beneficial users of groundwater and GDEs as required under SGMA, CDFW recommends the PVGSA provide a biological assessment identifying species known to occur within the GDEs. Therefore, CDFW recommends the PVGSA add southwestern willow flycatcher, least Bell's vireo, western spadefoot, Swainson's hawk, arroyo chub, arroyo toad, southwestern pond turtle, coast horned lizard, California legless lizard, California glossy snake, yellow-breasted chat, and yellow warbler to the final GSP. Given these species' dependency on GDEs, the Draft GSP must 1) accurately identify species that occur in the Basin and depend on groundwater; 2) identify species' habitats; and 3) identify potential effects on these species and their habitat from current and future groundwater pumping scenarios.

**Recommendation #1.1(b):** CDFW recommends the PVGSA map out the locations of ISWs, document aquatic habitats and other GDEs as required under SGMA. The PVGSA should provide appropriate consideration in the water budget for those habitats and the sensitive species that rely on them. Additionally, shallow groundwater levels near ISWs should be monitored to ensure that groundwater use is not depleting surface water and affecting fish and wildlife resources associated with the GDEs or ISWs.

**Recommendation #1.1(c):** CDFW recommends the PVGSA identify potential impacts of groundwater depletions to fish and wildlife beneficial users. Furthermore, the evaluation should consider species' water needs for all life history stages when defining undesirable results and

## Attachment A

## Page 3

setting minimum thresholds as required by SGMA (see Recommendation #1.1(a) for list of species). Understanding the timing of water availability with respect to species needs across all life history phases will allow groundwater planners to better account for groundwater management impacts to fish, wildlife, and users of groundwater and ISWs.

**Issue #1.2:** The National Marine Fisheries Service 2012 Southern California Steelhead Recovery Plan lists the San Luis Rey River as a Core 1 population. Core 1 populations are identified as the highest priority for recovery actions based on a variety of factors, including: the intrinsic potential of the population in an unimpaired condition; the role of the population in meeting the spatial and/or redundancy viability criteria; the current condition of the populations; the severity of the threats facing the populations; the potential ecological or genetic diversity the watershed and population could provide to the species; and the capacity of the watershed and population to respond to the critical recovery actions needed to abate those threats (NMFS 2012). Based on the information provided in the Draft GSP, CDFW is not able to determine if SC steelhead is present within the Basin. Historically, SC steelhead occurred in the USLR River (Swift et al. 1993). There are several historical records of SC steelhead at or very near the headwaters of the USLR River (e.g., reports from 1874 of native trout in Warner's pass at the head of the USLR River, and report by Eigenmann in 1890 describes native trout in Pala Creek, which is a tributary to the San Luis Rey River). As recent as 1946, Hubbs reported native trout abundant in stream near Smith Mountain (now Palomar Mountain) and Pala in the headwaters of the San Luis Rey systems (Swift et al. 1993). In 2007, an adult steelhead was reported in the lower section of the San Luis Rey River (Kataniak and Downie 2010) illustrating the potential for recovery of this species within this watershed. Additionally, two populations of resident rainbow trout persist within the watershed (Barabe 2019, Barabe 2020) and could be impacted by groundwater extraction. Furthermore, the drawdown of groundwater may impact the retention of sufficient flows for fish passage of the federally listed southern Distinct Population Segment of steelhead.

**Recommendation #1.2:** CDFW recommends the PVGSA identify SC steelhead as a species that has the potential to occur within the Basin and has the potential to be impacted by groundwater pumping.

**Comment #2 – Assessment of Groundwater Dependent Ecosystems (GDEs) and Interconnected Surface Waters (Section 3.3.4.4, Page 3-20):** The Draft GSP does not accurately identify potential GDEs relative to depth to groundwater.

**Issue #2.1:** A groundwater depth of 20 feet was applied to identify potential GDEs (Page 3-21). GDE identification, required by 23 CCR § 354.16(g), is based on methods that risk exclusion of ecosystems that may depend on groundwater. The Draft GSP removes potential GDEs with a depth to groundwater greater than 20 feet. According to the Draft GSP, *"[t]his depth is considered to be the typical extinction depth for most deep-rooted riparian vegetation; most roots of riparian vegetation would not be able to access groundwater resources if groundwater levels were deeper than this threshold. However, as noted previous, these areas (and their groundwater dependency) need to be evaluated by field investigation and through the collection of additional data"* (Pg. 3-21). The use of a 20-foot threshold may incorrectly exclude other natural communities within the Basin from further consideration as a GDE. The Nature Conservancy (TNC) identifies depth-to-groundwater levels within 30 feet as a general proxy for identifying natural communities as supported by groundwater (TNC 2019).

Attachment A

Page 4

**Recommendation #2.1(a):** The PVGSA should clarify depth to groundwater for GDEs throughout the Basin and conduct additional field studies as recommended in the Draft GSP's Appendix 3C. CDFW also recommends using TNC's guide on *Identifying GDEs under SGMA* (2019) to include habitat areas where groundwater depth is greater than 20 feet bgs, but is still sustained by groundwater. CDFW suggests these habitat areas be identified as GDEs in a GDE map in the final GSP.

**Recommendation #2.1(b):** CDFW recommends considering additional best available GDEs-related data and information when conducting GDE identification. Specifically, the PVGSA should consider TNC's shallow groundwater estimation tool (TNC 2021a), U.S. Geological Survey data on mapped springs/seeps (USGS 2019), and a comparison of recent groundwater level contours to vegetation root zones (TNC 2019). CDFW believes the shallow alluvial aquifer likely support GDEs and should be analyzed further in the Draft GSP. Groundwater within the shallow alluvial aquifers is likely critical to supporting "*ecological communities or species*" within the Basin (23 CCR § 351(m)).

**Issue #2.2:** The Draft GSP has indicated that the interaction between groundwater and surface water within the Basin is a data gap. Page 4-13 of the Draft GSP states, "*[s]ince the current evaluation is limited to model-simulated surface flows and groundwater levels in the areas identified as having vegetation that may be dependent on groundwater, site-specific monitoring of groundwater levels and surface flow gauges will be needed to confirm groundwater / surface water interactions. Sustainability management criteria may require refinement following collection of field data.*"

Hydrologic connectivity considerations include connected surface waters, disconnected surface waters, and transition surface waters. CDFW believes that shallow perched groundwater, bedrock groundwater, a subterranean stream, and surface water can still be connected to groundwater. ISWs and hydrologic connectivity cannot be ruled out without further analysis. A recent publication by TNC notes that, "*[i]f 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...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.*" (TNC 2019.) If hydrologic connectivity exists between a terrestrial or aquatic ecosystem and groundwater, then that ecosystem is a potential GDE and must be identified in a GSP. (23 CCR § 354.16 (g).) Therefore, hydrologic connectivity between surface water and groundwater, as well as groundwater accessibility to terrestrial vegetation, must be carefully evaluated.

**Recommendation #2.2(a):** CDFW recommends the PVGSA utilize the digital database of indicators of groundwater dependent ecosystems (iGDEs) from the *Mapping Indicators of Groundwater Dependent Ecosystems in California: Methods Report* (Klausmeyer et al. 2018) to review each of the ecoregion/vegetation types. In Klausmeyer et al. (2018), vegetation alliance descriptions from *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009) are used to classify vegetation communities. In addition to using the iGDEs database, CDFW also recommends field assessments be conducted to further reclassify vegetation communities based on the dominant plant species (Sawyer et al. 2009).



Attachment A

Page 5

**Recommendation #2.2(b):** CDFW recommends using Normalized Difference Vegetation Index (NDVI) and Normalized Difference Moisture Index (NDMI) to assess habitat health for all potential GDE areas on an annual basis. NDVI and NDMI should be used as early indicators of water stress on GDEs. NDVI and NDMI are remotely sensed color data that can be used as a refined proxy for vegetation health in the Basin. The TNC GDE Pulse tool (2021b) provides both a web viewer and access to the raw data to analyze these metrics over different periods of time (Klausmeyer et al. 2019).

**Recommendation #2.2(c):** If the PVGSA's revised analysis indicates that additional communities qualify as GDEs under SGMA, CDFW recommends the GSP's sustainable management criteria (SMC) be revised to facilitate timely monitoring and management response actions for all beneficial users within or supported by these GDEs. These GDEs should be monitored for groundwater levels and vegetative health to account for and mitigate potential adverse impacts to these GDEs from new production wells or expanded production from existing wells.

**Recommendation #2.2(d):** CDFW does not recommend relying solely on soils information to assess the presence of GDEs. For example, the presence of sandy, dry, and friable soils does not mean that existing plant species do not rely on groundwater for some portion of their life cycle. Capillary fringe associated with root networks from native plants could be accessing groundwater from deeper depths.

**Comment #3 – Section 4.4.4 Minimum Thresholds: Depletions of Interconnected Surface Water (Page 4-11):** Defaulting to the post-2015 low groundwater level as minimum thresholds because similar conditions have previously occurred does not account for relevant best available science (TNC 2021a; TNC 2021b; TNC 2019), including annual cycles and seasonal variation. Justifying the minimum thresholds for depletions of interconnected surface waters does not acknowledge that groundwater levels temporally fluctuate. Groundwater levels fluctuate over seasonal, interannual, or annual time scales due to California's Mediterranean climate, and climatic drought events.

**Issue:** The Draft GSP defaults to seasonal or historical low groundwater levels to establish minimum thresholds. The PVGSA states that:

- *“Undesirable results and MTs for depletions in interconnected surface water would be groundwater levels falling below the lowest groundwater level since 2015 in the identified areas with potentially dependent vegetation (Figure 3-23)” (Section 4.4.4, Page 4-11).*
- *“MOs for the depletion of interconnected surface water would be to maintain seasonal groundwater levels since 2015 in the identified areas with potentially dependent vegetation.” (Section 4.5.4, Page 4-13).*

The Draft GSP establishes minimum thresholds for groundwater levels based on record low static groundwater levels. This is not likely to prevent undesirable results to beneficial users, or ISWs, including GDEs (see Comment #2). The Draft GSP assumes that undesirable results would be avoided because any associated ISW depletions would not be worse than what occurred since 2015. Threshold levels for compliance should be defined in a way that reflects an annual cycle, including seasonal thresholds as well as inter-annual thresholds that reflect how levels have historically behaved during dry and wet periods — again, using the best

## Attachment A

## Page 6

available information (DWR 2016). The Draft GSP contends that only groundwater conditions that worsen beyond historic lows would constitute an undesirable result. However, GSPs must first evaluate potential adverse impacts to beneficial uses and users and determine at what groundwater levels those impacts would occur, and then set minimum thresholds accordingly.

Groundwater levels immediately preceding 2015 were likely unusually low due to limited surface water availability and/or heavier reliance on groundwater pumping during the drought period. Therefore, the levels during this drought period, or estimates of the levels, should be considered the low point in a wet-dry year cycle, and should be adopted as the bottom of the allowable range.

**Recommendation #3:** The Draft GSP should reselect minimum thresholds that would better protect environmental uses and users of groundwater, rather than defaulting to the historical low groundwater levels for the Basin.

**Comment #4 – Section 2.1.1 General Land Use Characteristics (Page 2-3) – Cannabis Cultivation (Cannabis Priority Watershed):** The Draft GSP identifies most of the land use within the basin as agriculture but does not identify cannabis cultivation as an agricultural use.

**Issue:** CDFW is concerned that current and future groundwater uses for cannabis cultivation are not being fully accounted for when evaluating this SGMA area. Cannabis is a water intensive crop (assuming six gallons of water per day per plant; Bauer S. 2015) that can have a significant impact to environmental beneficial users of groundwater. CDFW is concerned that without appropriate management of the two principal subbasins under SGMA by the PVGSA, significant and unreasonable surface water depletions may occur, compromising groundwater dependent ecosystems within and along the San Luis Rey River and its tributaries. Potential impacts to interconnected surface waters from groundwater use for cannabis cultivation projects should be assessed on an individual project basis and a cumulative level assessment.

San Diego County is in the process of becoming a permissible jurisdiction for cannabis cultivation. Additionally, CDFW and the San Diego County Sheriff's Department have discovered several unauthorized cannabis cultivation projects in the Basin; that is likely unaccounted for in the Draft GSP. CDFW understands that the water sources for the unauthorized cannabis cultivation projects are unknown and the PVGSA cannot account for it in the water budget. However, the water source for the majority of future authorized cannabis cultivation projects will likely be pumped groundwater.

**Recommendation #4(a):** CDFW recommends a more careful review of the existing information and future projection of cannabis cultivation within the Basin. The Draft GSP should account for future authorized cannabis cultivation projects in its water budget.

**Recommendation #4(b):** CDFW also recommends the PVGSA classify and monitor the Basin as a Cannabis High Priority Watershed, as the San Luis Rey River has been designated as such by CDFW, in coordination with the State Water Resources Control Board. Designating this area as a Cannabis High Priority Watershed should require groundwater to be measured, monitored, and sustainably managed for all beneficial uses, including groundwater dependent vegetated communities and interconnected surface waters that are necessary to support riparian and aquatic habitat, and associated special-status species. Without the designation of

Attachment A

Page 7

the Basin as a Cannabis High Priority Watershed, evaluation of cannabis crop water usage may be overlooked throughout the Basin. Based on the number of applications for legal cultivation in other permissible jurisdictions, there is documented significant demand and potential adverse impacts to beneficial users of groundwater.

## **GENERAL COMMENTS AND RECOMMENDATIONS**

### **Comment #5 – Draft GSP vs. Final GSP**

**Issue:** The PVGSA may need to revise the GSP before it is finalized and adopted.

**Recommendation #5:** CDFW recommends PVGSP provide a red-lined version of the final GSP to understand the changes made between the Draft GSP and final GSP. Alternatively, CDFW recommends PVGSA provide a summary of changes made and comments addressed by PVGSA in preparation of a final GSP.

## **CONCLUSION**

CDFW appreciates the opportunity to comment on the Draft GSP. CDFW recommends PVGSA address the comments above to avoid a potential 'incomplete' or 'inadequate' GSP determination per SGMA Regulations, as assessed by the Department of Water Resources, for the following reasons derived from regulatory criteria for GSP 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. [CCR § 355.4(b)(1)] (See Comments # 1, 2, 3, and 4);
2. The Draft GSP does not identify reasonable measures and schedules to eliminate data gaps. [CCR § 355.4(b)(2)] (See Comments # 2, 3, and 4);
3. The SMC and projects and management actions are not commensurate with the level of understanding of the basin setting, based on the level of uncertainty, as reflected in the Draft GSP. [CCR § 355.4(b)(3)] (See Comments # 2 and 3);
4. The interests of the beneficial uses that are potentially affected by the use of groundwater in the Basin, have not been considered. [CCR § 355.4(b)(4)] (See Comments # 1, 2, 3, and 4).

**Attachment B**

*LITERATURE CITED*

Barabe, R.M. 2019. Black bullhead removal from a headwater trout stream in southern California. North American Journal of Fisheries Management, Special Issue: Catfish 2020-The Third International Catfish Symposium. American Fisheries Society, Bethesda, Maryland.

Barabe, R.M. 2021. Population estimate of wild rainbow trout in a remote stream of southern California. California Fish and Wildlife 107(1):21-32.

Bauer S., Olson J., Cockrill A., van Hattem, M., Miller, L., and Tauzer, M. 2015. Impacts of Surface Water Diversions for Marijuana Cultivation on Aquatic Habitat in Four Northwestern California Watersheds.

CDFW. 2021. California Natural Diversity Data Base (CNDDDB). Accessed: November 18, 2021. Available at: <https://www.wildlife.ca.gov/data/cnddb>

California Department of Water Resources (DWR). 2016. Best Management Practices for the Sustainable Management of Groundwater: Water Budget. Accessed: November 18, 2021. Available at: [https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-4-Water-Budget\\_ay\\_19.pdf](https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-4-Water-Budget_ay_19.pdf)

Froend, R. and B. Sommer. 2010. Phreatophytic vegetation response to climatic and abstraction-induced groundwater drawdown: Examples of long-term spatial and temporal variability in community response. Ecological Engineering 36:1191:1200.

Kajtaniak, D, and S.T. Downie. 2010. San Luis Rey River Watershed Assessment. Coastal Watershed Planning and Assessment Program. California Department of Fish and Game.

Klausmeyer, K.R., B., Rohde, M.M., Schuetzenmeister, F., Rindlaub, N., Houseman, I., and Howard, J.K. 2019. GDE Pulse: Taking the Pulse of Groundwater Dependent Ecosystems with Satellite Data. San Francisco, CA.

Klausmeyer K., J. Howard, T. Keeler-Wolf, K. Davis-Fadtke, R. Hull, and A. Lyons. 2018. Mapping Indicators of Groundwater Dependent Ecosystems in California: Methods Report. San Francisco, California.

National Marine Fisheries Service. 2012. Southern California Steelhead Recovery Plan. Southwest Region, Protected Resources Division, Long Beach, California.

Naumburg E., Mata-Gonzalez, R., Hunter, R.G., McLendon, T., Martin, D.W. 2005. Phreatophytic vegetation and groundwater fluctuations: a review of current research and application of ecosystem response modeling with an emphasis on great basin vegetation. Environment Management 35(6):726-40.

O'Brien, J., and R.M. Barabe. 2022. Status and distribution of arroyo chub within its native range. California Department of Fish and Wildlife *in press*.

Attachment B

Page 2

Sawyer J.O., Keeler-Wolf T., and Evens, J.M. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society, San Francisco, CA.

Swift, C.C., Haglund, T.R., Ruiz, M., and Fisher, R.N. 1993. The Status and Distribution of the Freshwater Fishes of Southern California. Bull. Southern California Academy of Sciences. 92(3) 1993 pp. 101-167

The Nature Conservancy (TNC). 2021a. SAGE: Shallow Groundwater Estimation Tool. Accessed: December 31, 2021. Available at: <https://iqde-work.earthengine.app/view/sage>

TNC. 2021b. GDE Pulse Version 2. Accessed: November 18, 2021. Available at: <https://gde.codefornature.org/>

TNC. 2019. Identifying GDEs Under SGMA. Best Practices for using the NC Dataset.

United States Fish and Wildlife Service (USFWS) 1999. Arroyo toad (*Bufo microscaphus californicus*) recovery plan. U.S. Fish and Wildlife Service, Portland, Oregon. vi + 119 pp.

U.S. Geological Survey (USGS). 2019. National Hydrography Dataset (ver. USGS National Hydrography Dataset Best Resolution (NHD) for Hydrologic Unit (HU) 4 - 2001 (published 20191002)), accessed December 31, 2021 at: <https://www.usgs.gov/core-science-systems/ngp/national-hydrography/access-national-hydrography-products>