# Appendix 1-C Shasta Valley Comment Response Summary

# Shasta Valley Groundwater Sustainability Plan Public Comment Summary

## DRAFT

November 2021

Prepared for:

Siskiyou County Flood Control and Water Conservation District

Prepared by:

Stantec Consulting Services, Inc.

*This page left blank intentionally.*

November 2021

# Table of Contents



## LIST OF TABLES



## ABBREVIATIONS

| | |
|---|---|
| Advisory Committee | Shasta Valley Groundwater Basin Advisory Committee |
| Board | County of Siskiyou Board of Supervisors |
| CIN | Comment Identification Number |
| County | County of Siskiyou |
| DAC | Disadvantaged Community |
| District | Siskiyou County Flood Control and Water Conservation District |
| DWR | California Department of Water Resources |
| GDE | Groundwater-Dependent Ecosystem |
| GL | Groundwater Level |

| | |
|---|---|
| GS | Groundwater Storage |
| GSA | Groundwater Sustainability Agency |
| GSP | Groundwater Sustainability Plan |
| ISW | Interconnected Surface Waters |
| Matrix | Comment and Comment Response Matrix |
| MCR | Multiple Comment Response |
| SGMA | Sustainable Groundwater Management Act of 2014 |
| SMC | Sustainable Management Criteria |
| WQ | Water Quality |

## ATTACHMENTS

Attachment A – Notice to Cities, Counties, and Tribes

Attachment B – Annotated Comment Letters Received on Draft Groundwater Sustainability Plan

Attachment C – Shasta Valley Groundwater Sustainability Plan Comment and Comment Response Matrix

*This page left blank intentionally.*

**SHASTA VALLEY GROUNDWATER SUSTAINABILITY PLAN**
**PUBLIC COMMENT SUMMARY**

November 2021

# 1.0 INTRODUCTION

This Public Comment Summary (Summary) describes the process and tools used by the Siskiyou County Flood Control and Water Conservation District (District) Groundwater Sustainability Agency (GSA) to solicit, review, and respond to public and stakeholder comments on the Draft Shasta Valley Groundwater Sustainability Plan (GSP) and notify cities and counties within the plan area of the District's intent to adopt the GSP. These public review and notification processes were developed pursuant to the Sustainable Groundwater Management Act of 2014 (SGMA) and the California Department of Water Resources' (DWR) Groundwater Sustainability Plan Emergency Regulations, developed in May 2016.

California Code of Regulations (CCR) Title 23 Section (§) 355.4 provides the basis for DWR's determination of a GSP's compliance with SGMA and whether a GSP is likely to achieve the sustainability goal for the basin. As part of this criteria, DWR will consider:

> *(10) Whether the Agency has adequately responded to comments that raise credible technical or policy issues with the Plan. (§ 355.4(b)(10))*

This document reviews the GSA's actions to notify the public and other interested parties of the availability of the Draft GSP and the GSA's approach to soliciting, reviewing, and responding to technical and policy comments submitted by the public and other interested parties.

## 1.1 DOCUMENT FORMAT

This Summary is comprised of the following four sections:

- Section 1 – Introduction: Section 1 provides an overview of the purpose and structure of the document, as well as the GSP evaluation criteria for addressing comments on the GSP.
- Section 2 – Commenting Process: Section 2 describes the public comment process for the Draft GSP and method by which the GSA notified cities, counties, and Tribes within the plan area of the proposed plan. The notification letters are included as **Attachment A** to this Summary.
- Section 3 – Submitted Comments: Section 3 provides an overview of comment letters received on the Draft GSP during the public comment period. The comment letters in their entirety are included as **Attachment B** to this Summary.
- Section 4 – Comment Management and Review: Section 4 describes how the GSA reviewed and responded to comment letters received during the public comment period, including the processes for identifying and categorizing individual comments and responding to comments that raised credible technical and policy issues. This section also describes the tool used to manage the comments and comment responses. A copy of the final tool is provided as **Attachment C** to this Summary.

# 2.0 COMMENTING PROCESS

The GSA solicited public comments from individuals, agencies, and organizations representing beneficial uses and users of groundwater described in Water Code § 10723.2 as well as any other interested members of the public. This section describes the Draft GSP notification and public comment process. In addition, it describes the method by which the GSA notified cities and counties of availability of the Draft GSP, pursuant to California Water Code § 10728.4.

## 2.1 DRAFT GSP RELEASE AND PUBLIC COMMENT PERIOD

The District authorized the release of the Draft GSP on August 10, 2021. The Plan was released for public review and comment on Wednesday August 11, 2021, marking the beginning of a 45-day public comment period which ended on Sunday September 26, 2021. The GSA notified interested parties and members of the public of the release of the Draft GSP and public comment period through posting on the Siskiyou County website and an email sent out through the interested parties list.

Additional technical appendices to the Draft GSP were released during the public review and comment period on September 13, 2021. These appendices, listed below, provided supplemental, technical information only.

- Appendix 2E: Model Documentation
- Appendix 2I: ET and Applied Water Estimates
- Appendix 2J: Surface Diversion Estimates
- Appendix 3C: Water Level SMC
- Appendix 3D: ISW SMC

The Draft GSP was available for review on the County of Siskiyou website throughout the public comment period. In addition, hard copies of the documents were made available for review at the following public locations:

- Montague City Hall & Library, 230 S 13th St, Montague, CA 96064
- Weed City Hall, 550 Main St, Weed, CA 96094
- Weed Library, 150 Alamo Ave, Weed, CA 96094
- Yreka City Hall, 701 4th St, Yreka, CA 96097
- Yreka Library, 719 4th St., Yreka, CA 96097

Members of the public were provided three methods to submit comment on the Draft GSP:

1. Hard copies of comments could be sent by mail or hand delivered to the GSA mailing address: 1312 Fairlane Rd, Yreka CA 96097 with Attention to SGMA.

2. Electronic copies of comment could be submitted to the GSA email address at SGMA@co.siskiyou.ca.us.

3. Comment cards could be written and returned at the September 15 and 16 GSP Open Houses.

## 2.2 NOTICE TO CITIES, COUNTIES, AND TRIBES

SGMA (as chaptered in California Water Code § 10728.4) requires that:

> *A groundwater sustainability agency may adopt or amend a groundwater sustainability plan after a public hearing, held at least 90 days after providing notice to a city or county within the area of the proposed plan or amendment. The groundwater sustainability agency shall review and consider comments from any city or county that receives notice pursuant to this section and shall consult with a city or county that requests consultation within 30 days of receipt of the notice. Nothing in this section is intended to preclude an agency and a city or county from otherwise consulting or commenting regarding the adoption or amendment of a plan.*

Pursuant to these regulations, the GSA notified cities and counties within the GSP area of its intention to adopt the GSP at least 90 days before adoption of the Final GSP. This notification included a letter sent to the Cities of Yreka, Weed, and Montague, the Siskiyou County Board of Supervisors, and the Siskiyou County Planning Department on August 13 and 16, 2021. As a courtesy, the GSA also provided notice to the Yurok, Shasta Indian Nation, and Karuk Tribes. In addition to the letter, cities and counties were notified about release of the Draft GSP via postings on the Siskiyou County website and a local Yreka newspaper. The GSA received an informal request for government-to-government consultation with the Karuk Tribe on September 7. The GSA and Karuk attempted to coordinate a meeting prior to the close of the public comment period; however, they were not able to find a time given the short window of opportunity. Subsequently, the Karuk Tribe submitted a formal request for government-to-government consultation on September 20, pursuant to section III (v.) of the Memorandum of Understanding between the District and the Tribe. The GSA coordinated with the Karuk Tribe to conduct this government-to-government consultation. The requests for consultation as well as an example of the notification letter are included in **Attachment A** to this Summary.

## 2.3 PUBLIC AND STAKEHOLDER INPUT ON DRAFT GSP CHAPTERS

The GSA solicited input on the Draft GSP from stakeholders and members of the public through public meetings and workshops. The Shasta Valley Groundwater Basin Advisory Committee (Advisory Committee) is composed of eleven individuals representing beneficial users of groundwater in the basin. The Advisory Committee includes representation from agricultural groundwater users, residential groundwater users, water and irrigation agencies or districts, environmental/conservation organizations, and Tribal governments. The group provides information and recommendations to the GSA Board. The Advisory Committee was actively involved and provided input in development of the Draft GSP. Draft GSP chapters were brought

to the Advisory Committee for their review at regular public meetings and during internal public comment periods. Advisory Committee members also provided input on key GSP topics.

Members of the public had the opportunity to provide comments on Draft GSP chapters during public GSA Board meetings, Advisory Committee meetings, public workshops, and Draft GSP chapter public comment periods. The technical team also solicited comments via emails and phone calls with Advisory Committee members and other key stakeholders in the basin.

Draft GSP chapters and meeting materials were included in Advisory Committee and District meeting packets and posted on the District website. Preliminary drafts of GSP Chapters 2, 3, and 4 were made available on the GSA website to the public, Advisory Committee, and GSA Board on April 23 and 27, 2021. Draft Chapters 3 and 4 were also presented and discussed at the Board meeting on July 8, 2021.

The GSA also held two public workshops on August 17 and September 15 to inform and solicit input from stakeholders and members of the public about the content of the Draft GSP. The workshops were noticed via emails to the GSA's Interested Parties Database and on the District's website.

# 3.0 SUBMITTED COMMENTS

The GSA received 13 comment letters on the Draft GSP during the public comment period. One letter was submitted by an individual contributor. Twelve letters were submitted from organizations representing beneficial uses and users of groundwater in the region, including state and federal agencies, special districts, and organizations representing, environmental, and domestic users of groundwater. **Table 1,** shown below, provides the list of comments that were received on the Draft GSP, organized alphabetically by name. Copies of the comment letters received are provided in **Attachment B** to this Summary.

**Table 1. Submitted Comments**

| Commenter or Agency Name | Commenter Type | Date Comment was Received |
|---|---|---|
| California Department of Fish and Wildlife | State Agency | 9/23/2021 |
| California Trout | Non-Governmental Organization | 9/24/2021 |
| Friends of the Shasta River | Non-Governmental Organization | 9/26/2021 |
| Ginger Sammito | Individual Contributor | 8/30/2021 |
| Karuk Tribe | Tribe | 9/24/2021 |
| Klamath Tribal Water Quality Consortium | Tribes | 9/24/2021 |
| Mount Shasta Ecology Center | Non-Governmental Organization | 9/26/2021 |

| | | |
|---|---|---|
| National Marine Fisheries Service | Federal Agency | 9/23/2021 |
| NGO Consortium | Non-Governmental Organizations | 9/23/2021 |
| Quartz Valley Indian Community | Tribe | 9/24/2021 |
| Salmonid Restoration Federation | Non-Governmental Organization | 9/24/2021 |
| Scott Valley and Shasta Valley Watermaster District | Special District | 9/26/2021 |
| Shasta Headwaters Community Partnership | Non-Governmental Organization | 9/26/2021 |

# 4.0 COMMENT REVIEW AND RESPONSE

This section describes the process and tools the GSA used to review and respond to comments on the Draft GSP. Following the close of the public comment period, the GSA reviewed each comment letter to identify individual comments on the Draft GSP. To organize and manage the review of issue-specific comments, staff created a database, or matrix, that allowed for the categorization, grouping, and response to comments. This comment management approach is described below.

## 4.1 COMMENT MANAGEMENT

This subsection describes the process the GSA used to categorize each of the comment letters received on the Draft GSP and identify issue-specific comments for review and response. Of the 13 letters received, a total of 384 issue-specific comments applicable to the Draft GSP were identified. Each comment was assigned an individual comment identification number and entered into the database referred to as the Shasta Valley GSP Comment and Comment Response Matrix (Matrix), further described below. GSA staff then used the Matrix to group technical or policy issues raised on the GSP, identify potential changes to the GSP to address comments, and develop comment responses.

### 4.1.1 Comment and Comment Response Matrix

The Matrix is an Excel database developed and used by GSA staff and consultants to categorize and respond to comments submitted on the Draft GSP. **Table 2** describes the types of information included in the Matrix. A copy of the completed Matrix is provided in **Attachment C** to this Summary.

**Table 2. Shasta Valley Groundwater Sustainability Plan Comment and Comment Response Matrix Columns**

| Matrix Column | Column Description |
|---|---|
| Author | Name of agency or organization that signed or submitted the comment letter. |

| | |
|---|---|
| Comment Identification Number (CIN) | Unique identifier assigned to each comment received. A single comment letter may contain multiple individual comments, each with its own comment identification number. |
| Group | Comment grouping to facilitate structured review by Advisory Committee and GSA staff. |
| Sub-Category | Topic within the Draft GSP that the comment identifies with, describes, or otherwise raises questions about. |
| Description | Short description of the main topic or issues raised in the comment. |
| Code/Regulation | The code or regulation cited in the comment, if referenced. |
| Chapter, Page, and Line Number | The chapter, page, and line number in the Draft GSP cited in the comment, if referenced. |
| Comment | Copies of the comment text directly from the comment letter. |
| Response/Recommended Action | Response or recommended action to address the comment. |

Key:
GSA = Groundwater Sustainability Agency
GSP = Groundwater Sustainability Plan

### 4.1.2 Sub-Categories

To aid the comment management process, GSA staff and consultants assigned all comments a sub-category based on the primary topic or issue the comment raised. The sub-categories were used to review similar comments and assign the appropriate subject-matter expert to develop the comment response. **Table 3** provides a list of these sub-categories.

**Table 3. Groundwater Sustainability Plan Comment Sub-Categories**

| Acronym | Sub-Category |
|---|---|
| AL | Pumping Allocations/ Metering/ De Minimus Extractors/ Water Marketing/ Extraction – Water Accounting Framework |
| BR | Broader Regulations (such as: Endangered Species Act, Public Trust Doctrine) |
| DC | Disadvantaged Communities |
| DW | Domestic Wells |
| GA | GSA Organization |
| GD | Groundwater Dependent Ecosystems/ Environmental Beneficial Users |
| GE | General |
| GL | Groundwater Levels |
| GS | Groundwater Storage |
| GP | County General Plan |
| HM | Hydrogeologic Modeling |

| | |
|---|---|
| IS | Interconnected Surface Waters |
| LS | Land Subsidence |
| MA | Management Areas |
| MN | Monitoring Network |
| MU | Municipal Land/ Water Use |
| OR | Groundwater Sustainability Plan Organization |
| PM | Projects and Management Actions |
| PO | Public Outreach |
| SB | Subbasin Characteristics |
| TR | Transparency |
| WB | Water Budget/ Water Accounting Framework |
| WI | Well Inventory |
| WR | Water Resources/ Water Rights |
| WQ | Water Quality |

### 4.1.3 Comment Groups

After assigning sub-categories and writing brief descriptions of the comments, GSA staff and consultants conducted a detailed evaluation of the scope, relevance, and importance of each individual comment. Through this activity, staff and consultants conducted an initial grouping, or prioritization, of these comments based, in part, on their applicability to 23 CCR § 355.4(b)(10). These groupings are further described below.

- **"Group A":** Comments were assigned to Group A if they raised substantial technical, policy, or legal issues most likely to be subject to 23 CCR § 355.4(b)(10). Of the 384 comments received, 58 were assigned to Group A.
- **"Group B":** Comments were assigned to Group B if they required additional evaluation or significant changes to the GSP and considered valid technical or policy issues for focused review. This included comments that referred to content and themes included throughout the GSP and would require more consideration to address. Of the 384 comments received, 145 comments were assigned to Group B.
- **"Group C":** Comments were assigned to Group C if they primarily raised editorial issues or could be addressed without requiring further technical evaluations or significant changes to the GSP text. For example, if a comment indicated that a certain passage or section of the GSP could be improved through a closer editorial review, it was categorized as Group C. Of the 384 comments, 180 were assigned to Group C and directly addressed by the GSA and consultant staff.

## 4.2 REVIEW AND RESPONSE

This subsection describes the approach and process GSA and consultant staff used to review, respond to, and address comments received on the Draft GSP and approval of amendments to the Draft GSP. This review and response process included preparation of draft multiple comment responses and a meeting of the Shasta Valley Advisory Committee. These meetings, and their focus, are as noted in the following subsections.

### 4.2.1 Multiple Comment Responses

Comments of a similar nature were assigned a "Multiple Comment Response" or MCR. An MCR is a single response that applies to multiple comments of a similar nature. Draft MCRs pertaining to Group A comments were shared with the Advisory Committee in advance of the Comment Response Workshop. Based on feedback from the Workshop, the MCRs were finalized and are included in **Attachment C** to this Summary.

### 4.2.2 Comment Response Workshop

On October 26, 2021, the Shasta Valley Advisory Committee held a publicly noticed meeting to review and respond to comments GSA staff and consultants had identified as Group A comments. A draft of the Matrix was provided to the Advisory Committee on October 21 and posted on the District website. Copies of the annotated comment letters were also distributed to the Advisory Committee and posted on the website. Committee members were invited to amend the priority designations of Group B and C comments; however, none were revised to Group A status. The Group A comments fell into the following major topics:

- Public Trust Doctrine
- Groundwater Dependent Ecosystems
- State Water Resource Control Board Emergency Regulations
- Interconnected Surface Waters
- Project and Management Action Selection Criteria

Through a facilitated session, the GSA staff, consultants, and the Advisory Committee reviewed and provided staff direction, as appropriate, to approve or amend each of the staff-developed responses. The Advisory Committee reached a consensus vote on a recommendation to the District to adopt the Final GSP at its December 7 meeting, based on the agreed upon revisions to the Draft GSP. The Advisory Committee representative for the Karuk Tribe could not endorse the plan and the GSA is pursuing ongoing coordination with the Karuk Tribe to resolve any outstanding concerns.

### 4.2.3 Public Hearing <PLACEHOLDER>

On December 7, 2021, the Siskiyou County Board of Supervisors held a publicly noticed public hearing for adoption of the GSP. **Table 4** provides a summary of comments provided during the public comment period of the public hearing. The table provides the commenter's name and

affiliation, the comment provided, and direction provided to staff by the GSA Board (if any). This meeting was recorded and posted to the County's website. Members of the public will be able to further comment and provide feedback on the GSP during DWR's established comment period under California Water Code § 10733.4. The GSA will continue to track written comments provided to DWR.

**Table 4. Public Comments Received during the Public Hearing to Adopt <PLACEHOLDER>**

| Commenter Name | Commenter Affiliation | Comment Provided | Direction Provided to Staff by GSA Board |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# Attachment A – Notice to Cities, Counties, and Tribes

# COUNTY OF SISKIYOU

## Flood Control and Water Conservation District

P.O. Box 750 ▫ 1312 Fairlane Rd
Yreka, California 96097
www.co.siskiyou.ca.us

(530) 842-8005
FAX (530) 842-8013
Toll Free: 1-888-854-2000, ext. 8005


August 10, 2021
Attn: [Recipient]

**Subject: Notice of Upcoming Hearing for Adoption of Groundwater Sustainability Plans**

Dear [Recipient],

This letter is intended to provide the [Recipient] with notice of the Siskiyou County Flood Control and Water Conservation Districts (District) proposed adoption of a Groundwater Sustainability Plan (GSP) pursuant to California Water Code (CWC) section 10728.4. As required by the Sustainable Groundwater Management Act (SGMA) of 2014 (CWC §10720 et seq.), the District, acting as the Groundwater Sustainability Agency, must provide notice to a city or county within the area of the proposed GSP at least 90-days prior to holding a public hearing to adopt the GSP (CWC §10728.4).

The District has scheduled a public hearing to consider adoption of the Butte Valley, Shasta Valley and Scott River Valley GSP on December 7, 2021, at a time to be determined, during a meeting of the District, located in the Siskiyou County Board Chambers, 311 Fourth St, Yreka, CA 96097.

In accordance with CWC §10728.4, your city is eligible to request consultation with the District in advance of the public hearing. If you wish to consult with the District regarding the adoption of its GSP, please provide notice within 30 days of receipt of this letter.

You may also submit comments on the GSP during the scheduled public comment period. All relevant material, including instructions for commenting, can be found in a downloadable pdf format on the District's website at the following link: https://www.co.siskiyou.ca.us/naturalresources/page/sustainable-groundwater-management-act-sgma

If you have any questions, contact Matt Parker, Natural Resources Specialist at (530) 842-8019, or mparker@co.siskiyou.ca.us. This letter was approved by the Siskiyou County Board of Supervisors on August 10, 2021 by the following vote:

AYES: Director Criss, Kobseff, Valenzuela, Ogren and Haupt
NOES: None
ABSENT: None
ABSTAIN: None

Sincerely,

Ray A. Haupt, Chair
Siskiyou County Flood Control and Water Conservation District

Karuk Community Health Clinic
64236 Second Avenue
Post Office Box 316
Happy Camp, CA 96039
Phone: (530) 493-5257
Fax: (530) 493-5270

# Karuk Tribe

Karuk Dental Clinic
64236 Second Avenue
Post Office Box 1016
Happy Camp, CA 96039
Phone: (530) 493-2201
Fax: (530) 493-5364

Administrative Office
Phone: (530) 493-1600 • Fax: (530) 493-5322
64236 Second Avenue • Post Office Box 1016 • Happy Camp, CA 96039



September 7th, 2021

Ray Haupt, Chair
P.O. Box 750
1312 Fairlane Road
Yreka, CA 96097

**RE: Government to Government Meeting Request; Comments Sustainable Groundwater Management Plan**

Ayukîi Supervisor Haupt:

The Karuk Tribe appreciates the efforts of you and the County of Siskiyou to develop Sustainable Groundwater Management Plans for the Scott and Shasta Valleys. Groundwater use impacts stream flows and fisheries habitat critical to the survival of salmon, steelhead, lamprey and other species the Karuk rely on not only for our sustenance but our cultural identity as well. Therefore, we are very interested in the development of a Sustainable Groundwater Management Plan for the Scott and Shasta Valleys.

We are writing to request an informal consultation meeting pursuant to the Memorandum of Understanding (MOU) between the Siskiyou County Flood Control and Water Conservation District and the Karuk Tribe, Section III (v). the purpose of the meeting is to discuss the timeline for comments on the draft Sustainable Groundwater Management Plan and specific concerns with the Plan.

As per the MOU, we would like to convene two elected offices from the County and the Tribe along with pertinent staff. Current COVID protocols are such that an electronic teleconference would be most appropriate.

Barbara Snider is the Tribal Council executive secretary and can work with a designated counterpart from the County to arrange meeting details. Barbara can be contacted either via phone, (530) 493-1600 extension 2036, or email bsnider@karuk.us.

Yootva,

Russell "Buster" Attebery
Chairman

**Enclosure: Memorandum of Understanding between the Siskiyou County Flood Control and Water Conservation District and the Karuk Tribe**

**Karuk Community Health Clinic**
64236 Second Avenue
Post Office Box 316
Happy Camp, CA 96039
Phone: (530) 493-5257
Fax: (530) 493-5270

# Karuk Tribe

**Administrative Office**
Phone: (530) 493-1600 • Fax: (530) 493-5322
64236 Second Avenue • Post Office Box 1016 • Happy Camp, CA 96039

**Karuk Dental Clinic**
64236 Second Avenue
Post Office Box 1016
Happy Camp, CA 96039
Phone: (530) 493-2201
Fax: (530) 493-5364

October 20th, 2021

Ray Haupt, Chair
PO Box 750
1312 Fairlane Road
Yreka, CA 96097

**RE: Government to Government Meeting Request**

Ayukîi Supervisor Haupt:

On September 7, 2021, pursuant to section III. (v.) of the Memorandum of Understanding (MOU) between the Siskiyou County Flood Control District (District) and the Tribe signed in March of 2020, the Tribe transmitted a request for an informal consultation meeting to discuss "the timeline for comments on the draft [Scott and Shasta] Sustainable Groundwater Management Plans and specific concerns with the Plan."

District staff communicated by email that there were no available meeting times to meet our request prior to the deadline for comments on the draft Plans.

On September 24, 2021 the Tribe received a letter from the District offering to meet with the Karuk Tribe. However, one of our key issues was the deadline for comments. Because the District did not release all of the 600+ pages of technical information used to develop the draft Plans when the draft Plans were released, it was difficult for Tribal staff and consultants to prepare thorough comments. By failing to meet with the Tribe in a timely manner, the District provided no opportunity to resolve issues arising from the development of the Plans.

Because our issue was not addressed or resolved in a timely manner consistent with section III. (v.) of the MOU, the Karuk Tribal Council invites the District to participate in an official Government to Government consultation meeting that would include a majority of the Karuk Council and the District Board and held in accordance with the Ralph M. Brown Act pursuant to section III. (vi.) of the MOU. The meeting will be held virtually due to COVID-19, please have appropriate staff contact Executive Secretary Barbara Snider to schedule at 530-493-1600 ext2036 or bsnider@karuk.us

The agenda of this meeting shall include a discussion of the ground water crisis the Plans are supposed to address, the consequences of failing to address the groundwater crisis, and our specific concerns with the draft Plans. Any unresolved issues in addition to our already filed comments shall be documented and forwarded to the District Board in accordance with Section III (vii.) of the MOU.

Yôotva,

Russell "Buster" Attebery
Karuk Tribe Chairman

# Attachment B – Annotated Comment Letters Received on Draft Groundwater Sustainability Plan

# COUNTY OF SISKIYOU

**Flood Control & Water Conservation District**

# Review Form

## Shasta Groundwater Sustainability Plan

---

Dear Reviewer,

Per SGMA requirements, a Groundwater Sustainability Plan (GSP) has been developed for the Shasta Valley groundwater basin. The GSA has released a complete draft GSP and has initiated a 45-day public review and comment period and seeks input from all beneficial users of groundwater.

**REVIEWER INSTRUCTIONS:**
Given the large number of reviewers, accommodating track changes or other editing options within the original draft sections distributed to all committee members is not possible. Please consider using this reviewer form with the following instructions:

- Use the form below to provide comments. Feel free to add additional lines to the form as needed.
- For suggested text changes, please copy and paste the text you wish to change and place your suggested edits in track changes or strikethrough features in this document. What's important is that technical staff can see *both* the original draft text and your distinct suggestions.
- Note the **Chapter, Page, Section, and line number**—from the ***PDF version*** of the draft GSP section—where your comment, question or suggested text edit begins.
- Examples of how to provide feedback are listed in the review form below. These examples are not actual comments and are made up to show how the table should be used. Feel free to delete these examples with your submission, and only include your feedback.
- To comment on a figure or table, in the line number column on the reviewer form note the figure number *and* the page number and type your comment in the text section to the right.

Please email comments directly to (sgma@co.siskiyou.ca.us). Include in the subject line the basin you are commenting on. If you are making comments on multiple basins, send as separate comments.

**Please send your comments no later than end of day September 26, 2021. Comments will not be accepter on or after September 27th, 2021.**

Please use the following file nomenclature in saving your review document:
*ShastaGSP_PublicReviewDRAFT_[Your name]_date*

Thanks for contributing to the draft Groundwater Sustainability Plan for the Shasta Valley Groundwater Basin

# COUNTY OF SISKIYOU

**Flood Control & Water Conservation District**

Reviewer name:
Submission date:
GSP sections reviewed:

| Chapter | Page | Section | Line/Table/Figure # | Comment (*please delete example text below once you submit*) | |
|---|---|---|---|---|---|
| Chapter 2: | | | 151-153 | Need to define what constitute a domestic well upper bound. Is it 450 gpm? 100gpm? | GS-001 |
| | 35 | 2.2.1.2 | figure#8 | Graph depicts data up to 2005 yet verbiage states 2020 | GS-002 |
| | 39 | 2.2.1.2 | Figure #12 | Need to define xxx place holders. Probably just overlooked | GS-003 |
| Chapter 3: | 7 | 3.3 | 178-188 | What about large capacity well which are on large generators and do not have a large land base case in point is APN: 019-661-410-000 which has a 2,500-gallon capacity well on 4.06 acres. | GS-004 |
| Chapter 3: | 9,10 | | Figure 1,2 | x-axis needs to be cleaned up. Maybe just being/end value | GS-005 |
| | 35 | 3.4.1.1 | 599-605 | Excessive number is ambiguous statement. What number determined excessive? | GS-006 |

| | | | | | |
|---|---|---|---|---|---|
| | | 3.4.3.2 | Table 7 | What is the significance defined by the asterisk next to the values? Maybe just need a statement here. | GS-007 |
| Chapter 4: | 4 | 4.1 | 153 | A permit is required for extraction within and outside basin now | GS-008 |
| Chapter 4: | 14 | 4.2 | 335 | The only way to acquire valid data is to house the well drillers report within this county so the information will be readily available to SGMA | GS-009 |

# COUNTY OF SISKIYOU

**Flood Control & Water Conservation District**

# COUNTY OF SISKIYOU

**Flood Control & Water Conservation District**

# Review Form

## Shasta Groundwater Sustainability Plan

---

Dear Reviewer,

Per SGMA requirements, a Groundwater Sustainability Plan (GSP) has been developed for the Shasta Valley groundwater basin. The GSA has released a complete draft GSP and has initiated a 45-day public review and comment period and seeks input from all beneficial users of groundwater.

**REVIEWER INSTRUCTIONS:**
Given the large number of reviewers, accommodating track changes or other editing options within the original draft sections distributed to all committee members is not possible. Please consider using this reviewer form with the following instructions:

- Use the form below to provide comments. Feel free to add additional lines to the form as needed.
- For suggested text changes, please copy and paste the text you wish to change and place your suggested edits in track changes or strikethrough features in this document. What's important is that technical staff can see *both* the original draft text and your distinct suggestions.
- Note the **Chapter, Page, Section, and line number**—from the ***PDF version*** of the draft GSP section—where your comment, question or suggested text edit begins.
- Examples of how to provide feedback are listed in the review form below. These examples are not actual comments and are made up to show how the table should be used. Feel free to delete these examples with your submission, and only include your feedback.
- To comment on a figure or table, in the line number column on the reviewer form note the figure number *and* the page number and type your comment in the text section to the right.

Please email comments directly to (sgma@co.siskiyou.ca.us). Include in the subject line the basin you are commenting on. If you are making comments on multiple basins, send as separate comments.

**Please send your comments no later than end of day September 26, 2021. Comments will not be accepter on or after September 27th, 2021.**

Please use the following file nomenclature in saving your review document:
*ShastaGSP_PublicReviewDRAFT_[Your name]_date*

Thanks for contributing to the draft Groundwater Sustainability Plan for the Shasta Valley Groundwater Basin

# COUNTY OF SISKIYOU

**Flood Control & Water Conservation District**

Reviewer name:
Submission date:
GSP sections reviewed:

| Chapter | Page | Section | Line/Table/Figure # | Comment (*please delete example text below once you submit*) | |
|---|---|---|---|---|---|
| ES | 3 | ES-1 | 98 | Available for the Basin dates back to ~~e~~at least (typo) | CT-001 |
| 101 | 3 | ES-1 | 101 | What is Error! Reference source not found? | CT-002 |
| 2 | 4 | 2.1.1 | 91 | cover ~~a~~ the northern (typo) | CT-003 |
| 2 | 12 | 2.1.2 | 162 | This section never mentions the Public Trust Doctrine despite the GSP acknowledging that groundwater and surface water in the basin are interconnected (line 110) | CT-004 |
| 2 | 28 | 2.1.4.2 | 695-697 | "[t]here is not substantial enough data to include groundwater use estimates from illegal cannabis production in the overall and future water budgets." → How can the GSA ensure accurate water budgets if it excludes this potentially significant, albeit illegal, use of groundwater? | CT-005 |
| 2 | 39 | 2.2.1.2 | Figure 12 | Is this the updated figure? | CT-006 |
| 2 | 63 | 2.2.1.4 | 1136 | "soil groups are described in Table (XXX)" → what table does this refer to? | CT-007 |
| 2 | 105 | 2.2.2.6 | 2052-2054 | "the Shasta River surface water network contains many miles of stream channel that are connected to groundwater. The Shasta River and | CT-008 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | its major tributaries are all considered part of the interconnected surface water system in the Basin." → Given this statement, the GSP needs to include Public Trust considerations, as the public trust doctrine applies to the management of groundwater that impacts a public trust resource (here, the Shasta River). | CT-008 (contd.) |
| 3 | 6 | 3.3 | 134 | Per 23 C.C.R. § 354.34(b)(1-4) | CT-009 |
| 3 | 6 | 3.3 | 152 | Section 351(l) | CT-010 |
| 3 | 7 | 3.3 | 179-180 | "Owners and/or operators of groundwater wells, meeting a certain criteria, are *encouraged* to report pumping volumes" (emphasis added) → what is landowners do not want to share information? | CT-011 |
| 3 | 30 | 3.3.4.2 | 511 | Why will this take 10 years? | CT-012 |
| | | | 1138-1139 | "Arsenic, boron, iron, manganese, and pH do not have an SMC because they are naturally occurring." → what if groundwater pumping increases the concentration of these constituents? | CT-013 |
| 4 | 6-10 | 4.1 | Table 4.1 | General thoughts about PMAs:<br>- Most of the tier 1 actions rely on another entity acting<br>- If the restriction of groundwater pumping is in Tier 3, it will likely not be implemented soon enough to improve conditions. This | CT-014 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | triggers public trust doctrine concerns. | CT-014 (contd.) |
| 5 | 10 | 5.1.2 | 299-337 | Concerning that the only concrete action the GSA commits to is "coordination." What is the GSA's strategy for implementing this GSP? | CT-015 |

# COUNTY OF SISKIYOU

**Flood Control & Water Conservation District**

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Northern Region
601 Locust Street
Redding, CA 96001
(530) 225-2300
www.wildlife.ca.gov

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

September 23, 2021

Via Electronic Mail

Matt Parker
Natural Resources Specialist
Siskiyou County Flood Control and Water Conservation District
1312 Fairlane Road
Yreka, CA 96097
MParker@co.siskiyou.ca.us
SGMA@co.siskiyou.ca.us

**SUBJECT: CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE COMMENTS ON THE SHASTA VALLEY BASIN DRAFT GROUNDWATER SUSTAINABLITY PLAN**

Dear Matt Parker:

The California Department of Fish and Wildlife (Department) appreciates the opportunity to provide additional comments on the Draft Groundwater Sustainability Plan (GSP) for Shasta Valley Basin (Basin) prepared by Siskiyou County Flood Control and Water Conservation District, designated as the Groundwater Sustainability Agency (GSA).

Since the Basin is designated as medium priority under the Sustainable Groundwater Management Act (SGMA), it must be managed under a Groundwater Sustainability Plan (GSP) by January 31, 2022. In addition to the comments herein, the Department has provided other input into the proposed Draft GSP. On April 28, 2020, the Department provided comments in advance of the preparation of the Draft GSP which outlined general guidance, basin information, and recommended tools available to the GSA. The Department's April 28, 2020, comments focused on the Department's role as a trustee agency. In that role, the Department has an interest in the sustainable management of groundwater, as many sensitive ecosystems and species depend on groundwater and interconnected surface waters (ISWs). Specifically, the Department is concerned with the decline of salmonid populations due to the lack of quality aquatic habitat. The Department provided the Shasta River Canyon Instream Flow Needs Assessment (McBain and Trush 2014) as guidance when developing an interim target flow to avoid extirpation of salmonids. The Department recognizes a more thorough watershed wide study is required to

achieve the needs of all sensitive ecosystems and species dependent on groundwater and ISW in the Basin.

## Background

The GSA appointed an Advisory Committee, composed of members of the Basin community, to work with a group of consultants to develop the Draft GSP. The Advisory Committee requested comments from any stakeholder as it developed the Draft GSP. The Department previously provided comments during Advisory Committee meetings, and on certain draft Chapters as they were made available. During Committee meetings, the Department provided comments on issues including the following: use of the best available science and information to develop the model; the water budget; identification and consideration of beneficial users and groundwater-dependent ecosystems (GDEs); well information as it relates to Department-owned and managed properties; and sustainable management criteria. The Draft GSP does not fully address all comments the Department provided during the Advisory Committee meetings. After its review of the Draft GSP, the Department also has additional comments that it had not raised previously. Therefore, the Department is commenting again at this point in time to ensure all of these comments are fully considered in the development of the Draft GSP.

## Organization of Comments

The Department has organized its comments below into nine key areas of concern: (1) the Department's trustee agency role; (2) SGMA requirements relevant to beneficial users and GDEs; (3) SGMA hydrogeologic conceptual model requirements; (4) sustainable management criteria and water budget requirements; (5) monitoring network and well information; (6) data gaps and use of the best available science; (7) implementing projects and management actions (PMAs); (8) Public Trust Doctrine and California Endangered Species Act (CESA) requirements; and (9) SWRCB Emergency Regulations. This letter highlights key comments and is not inclusive of all comments provided to the Advisory Committee during meetings and/or communication with County staff. In addition, the model documentation, water budget information, water level sustainable management criteria, and interconnected surface water sustainable management criteria were not provided until September 13, 2021. Since the completed Draft GSP was not publicly available since the beginning of the public review period, limited time was available for review and comment of certain sections of the Draft GSP.

**Department's Trustee Role**

As the 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 & G. Code §§ 711.7 & 1802.) The Shasta River watershed (included in the Klamath River watershed) provides aquatic habitat for four species of anadromous fish: Chinook Salmon, Southern Oregon/Northern California Coast (SONCC) Coho Salmon (CESA and Endangered Species Act (ESA) threatened), Steelhead Trout, and Pacific Lamprey (State species of special concern). The Shasta River watershed also supports populations of bank swallow (CESA threatened), western pond turtle (State species of special concern), foothill yellow-legged frog (State species of special concern), greater sandhill crane (CESA threatened), willow flycatcher (CESA and ESA endangered), black tailed deer, pronghorn and other fish and wildlife species that rely on habitats supported and supplemented by groundwater. In addition, the Shasta River watershed is one of five priority streams under the 2019 California Water Action Plan, which includes an objective for the Department to protect and restore important ecosystems through flow enhancement activities (Action 4).

The Department has significant concerns about potential impacts of groundwater pumping on GDEs and interconnected surface waters (ISWs), including ecosystems on Department-owned and managed lands within SGMA-regulated basins. The Department owns the Shasta Valley Wildlife Area, on Little Shasta River, and Big Springs Wildlife Area within the Big Springs complex of the headwaters of Shasta River. The Department urges the GSA to plan for and engage in responsible groundwater management that minimizes or avoids these impacts to the maximum extent feasible as required under applicable provisions of SGMA and the Public Trust Doctrine. CDFW-001

**SGMA Requirements Relevant to Beneficial Users and GDEs**

In addition to other requirements that will be discussed later in this letter, SGMA and its implementing regulations afford beneficial users and GDEs specific consideration, including the following as pertinent to GSPs.

Consideration of Beneficial Uses and Users

GSPs must consider the interests of all beneficial uses and users of groundwater, including environmental users of groundwater. (Water Code § 10723.2.) GSPs must also **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).) The Draft GSP does not adequately identify all the environmental users in the Basin, their locations, the groundwater dependent habitat they depend on at certain life stages, and how the Draft GSP will meet their needs. The Draft GSP identifies in Table 6 of Chapter 2, ESA or CESA species found in Siskiyou County. The Draft GSP identifies in Table 7 of Chapter 2, species prioritized for management in the first column, and other species that depend on the same ecosystems as the species prioritized for management in the second column. The Draft GSP species prioritized for management were identified as "riparian vegetation," which is a vegetation type, not an ecosystem or species. While this column identified salmonids as a species prioritized for management, the Draft GSP did not provide objectives that would be anticipated to support salmonids. Instead, the GSP provided objectives intended to minimize sediment erosion into streams where bank swallows exist that depend on erosion for their management. This choice of objectives suggests that the Draft GSP does not recognize the unique life histories of these species that may give rise to differences in management needs between salmonids and other species. In addition, many species, including special-status species, that are known to depend on or may be vulnerable to groundwater fluctuations were not identified in the first column. These include bank swallow, foothill yellow legged frog, western pond turtle, greater sandhill crane and willow flycatcher to name a few. The Draft GSP does not indicate where these species are found in the basin and how these individual species could be impacted by groundwater.

CDFW-002

CDFW-003

CDFW-004

Identification and Consideration of GDEs

GSPs must **consider impacts to GDEs**. (Water Code § 10727.4(l); *also see* 23 CCR § 354.16(g).) The Department is uncertain whether the Draft GSP accurately identifies all GDEs in the Basin. Specifically, the Draft GSP does not provide sufficient detail when describing the methods used for GDE classification and mapping included in the Draft GSP and rationale for the methods used. The Draft GSP mentions tabletop methods of using existing mapping tools, root depth to groundwater modeling and other tools for identifying GDEs. However, it also fails to include Advisory Committee input or field verification of the identified GDEs. Without these means of verification, the Department cannot evaluate or comment on the accuracy of the GSP's GDE classification or mapping. The Department recommends that GDE mapping is informed by science-based vegetation classification or similar methods, such as the Department's *Survey of California Vegetation Classification and Mapping*

CDFW-005

*Standards.*[1] The Draft GSP's classification and mapping should be revised if necessary after utilizing these methods. Classification and mapping methods should be thoroughly described so that GDE classification and mapping can be verified by stakeholders or repeated during future GSP updates and effectiveness monitoring.

CDFW-005 contd.

**Hydrogeologic Conceptual Model Requirements**

SGMA regulations require each GSP to include a descriptive hydrogeologic conceptual model (HCM) of the basin based on technical studies and qualified maps that characterizes the physical components and interaction of the surface water and groundwater systems in the basin. (23 CCR § 354.14.) The HCM must include a description of data gaps and uncertainty within the HCM. (*Id*. at § 354.14(b)(4)(5).)

While the Draft GSP includes an HCM, the Department is uncertain that the HCM accurately characterizes the physical components and surface water-groundwater interactions in the Basin. For example, the GSP does not properly identify and characterize the principal aquifers and aquitards within the Basin as required by applicable SGMA regulations. (23 CCR §354.14 (b)(4)(B) and (C).) The Draft GSP provides a regional description of the aquifer system(s) within the Basin without specifying the principal aquifer system is collectively within the basin. It would be helpful to identify the principal aquifer system within the Basin, and characterize the vertical and lateral extent of these assemblages in relation to one another. The Draft GSP should characterize associated aquifer parameters (i.e., hydraulic connectivity and specific yield/storativity) where each of the forementioned aquifer assemblages are located, and characterize or define the lateral and vertical extent of existing aquitards/confining layers within the Basin. In addition, the Department's understanding is that the Draft GSP does not clearly identify a definable bottom of the Basin as required by applicable SGMA regulations. (23 CCR §354.14 (b)(3).) The Draft GSP provides a discussion of the geologic units from oldest to youngest within the Basin but does not identify a definable base between the alluvial material and deeper hard rock material in the Basin.

CDFW-006

CDFW-007

The Draft GSP is required to provide a description of historic and current water level trends within the Basin. Pursuant to that requirement, the Draft GSP needs to provide groundwater level elevation contour maps depicting the

CDFW-008

[1] https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=102342&inline

groundwater table or potentiometric surface associated with current seasonal highs and seasonal lows and hydraulic gradients between principal aquifers. Different sections of the Draft GSP provide varying yields for Pluto's Cave, ranging from 1,000-4,000 gallons per minute. The Draft GSP should be consistent in its description of yields. If a range is used for this location or other springs in the Basin, it should not have a large range of variation. In addition, the source of recharge for the springs should be identified if known. The Department suspects the source of the recharge for the springs is likely snowmelt. It would be beneficial if this could be confirmed and included in the Draft GSP. Similarly, for extractions, it would be helpful to describe the points of diversion of surface water in text and with a map, including extractions from water districts and municipalities. The Department was unable to locate groundwater elevation contour maps that complies with applicable SGMA regulations that require characterization of the current seasonal highs and lows of the principal aquifer within the Basin. (23 CCR §354.16 (a)(1).) The referenced appendices include a set of presentation slides. The Department recommends supplementing these slides with discussion of the model inputs and associated literature cited to provide a greater understanding of the model and facilitate evaluation of compliance with applicable SGMA requirements.

CDFW-008 contd.

CDFW-009

CDFW-010

CDFW-011

CDFW-012

**Sustainable Management Criteria and Water Budget Requirements**

GSPs must **establish sustainable management criteria that avoid undesirable results** within 20 years of the applicable statutory deadline, including **depletions of ISW 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).) The Draft GSP concludes that sustainability will be achieved by 2042 and undesirable results will be avoided, but the Department has concerns about the analysis and data underlying these conclusions. The goal of sustainability cannot be achieved by 2042 without an accurate water budget and clearly-defined sustainable management criteria, including minimum thresholds and measurable objectives, that meet requirements including the following:

CDFW-013

Measurable Objectives and Minimum Thresholds for ISW Depletions
For each relevant sustainability indicator, the GSP must describe quantitative measurable objectives to achieve the sustainability goal for the basin by 2042 and maintain sustainable management thereafter. (23 CCR § 354.30(a).) SGMA regulations require the GSP to include numeric minimum thresholds to define and avoid undesirable results, which must be explained and justified based on basin-specific information and other data or models as appropriate, with

appropriate accounting for any uncertainty in the understanding of the basin setting. (*Id*. at § 354.28(a)-(b).) The GSP must explain the relationship between the minimum thresholds and the relevant sustainability indicator, how the minimum thresholds will avoid causing undesirable results, how the minimum thresholds may affect the interests of beneficial uses and users of groundwater, and how each minimum threshold will be quantitatively measured consistent with SGMA monitoring network requirements. (*Id*.)

SGMA regulations require minimum thresholds related to depletions of interconnected surface water to 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).) These minimum thresholds must be supported by the "location, quantity, and timing of depletions of interconnected surface water" and "a description of the groundwater and surface water model used to quantify surface water depletion." (*Id*. at § 354.28(c)(6).) If a numerical groundwater-surface water model is not used to quantify surface water depletion, the GSP must identify and describe an equally effective method, tool, or analytical model to be used for this purpose. The Draft GSP does not meet these requirements because it does not set minimum thresholds based on the rate or volume of surface water depletions caused by groundwater use, and it does not utilize a basin-wide groundwater-surface water model or equally effective method, tool, or model to quantify such depletions.

CDFW-014

In the Draft GSP, sustainable management criteria related to depletions of interconnected surface water have not been clearly defined. The GSP claims to have considered measured groundwater contributions and the protection of GDEs through equations and numbers identifying the minimum thresholds and measurable objectives. Based on the limited explanation and justification in the GSP, the Department does not understand how the equations and numbers will ensure adequate protection of fish and wildlife resources and habitat. These equations and general numbers do not clearly articulate how they will affect beneficial users' needs or how data gaps in the understanding of the basin have been addressed. The numbers and equations do not relate to flows needed to support species and habitat, and the equations do not appear to produce specific quantitative metrics protective of resource needs. While interim milestones are provided, it is unclear how they will provide a "reasonable path" to achieving sustainability because they are also framed in terms of equations and percentages without relation to a specific value to ensure sustainability. The Department is also concerned that the analysis omits Upper Little Shasta River and fails to account for the fact that the stream annually

CDFW-015

CDFW-016

CDFW-017

disconnects. As required per SGMA regulations, the Department requests revisions to the draft GSP to clarify how the sustainable management criteria were developed, how these criteria relate to the relevant sustainability indicators and how the criteria may affect the interests of beneficial users.

CDFW-017 contd.

CDFW-018

The Draft GSP's sustainability criteria also fail to account for the fact that the State Water Resources Control Board (SWRCB) has declared Shasta River a fully appropriated stream system (FASS) during part of the year, meaning insufficient supply is available for new water right applications at this time (Water Right Order 98-08). The FASS determination was based on numerous water rights decisions and orders that determined that allocated water likely exceeds available supplies from May 1 to October 31 each year (i.e., supplies are likely over-allocated at this time). The Draft GSP anticipates that surface water users and the Scott Valley and Shasta Valley Watermaster District (SSWD) will be able to maintain sufficient flows instream. However, given likely over-allocation and potential surface water depletions from groundwater pumping, which the GSA has not analyzed adequately, this assumption may not be realistic. As explained more fully below, the Department recommends revisiting the Draft GSP to address data gaps, ensure compliance with applicable SGMA statutory requirements, and appropriately consider and address impacts to GDEs and all beneficial users.

CDFW-019

Furthermore, the GSA should not wait for additional California Water Action Plan deliverables for the Shasta River before determining and implementing "sufficient flows for salmonid species within the Shasta River." The Department has provided best available science that can be used to answer this question now rather than referring to an "aspirational watershed goal." Please see the Department's previous April 28, 2020, letter for details on this best available science and the needs of other special-status species that require attention beyond salmonids. In sum, the Department recommends that the GSA establish sustainable management criteria based on the best available science that meets the needs of all beneficial users.

CDFW-020

Water Budget

Per SGMA regulations, each GSP "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).) The water budget is a product of the Shasta Valley Integrated Hydrologic Model (SVIHM). The Department acknowledges that

Department of Water Resources (DWR) allows the use of models to prepare Water Budget in Basins; however, DWR also stresses the importance of using reliable data sets when available to increase the accuracy of the models output. The Draft GSP indicates no extraction information was available for wells within the Basin at the time of preparing the model. The Draft GSP does not discuss the utilization of evapotranspiration (ET) estimates to determine rates of aquifer pumping specific to crop type to quantify groundwater extraction values for development of the water budget. The Department understands that this method may be the best available science at present but suggests that the GSA consider remedying the issues regarding lack of accurate well information and groundwater usage data sets needed to adequately characterize groundwater levels and groundwater in storage within the Basin. CDFW-021

The Draft GSP provides a discussion in Chapter 2 about estimating specific yield using the SVIHM. The Draft GSP states the Basin is not overdrafted and "while groundwater levels declined during the 2012-2015 drought, levels quickly rebounded back." Similarly, the Draft GSP discusses how irrigation efficiency improvement projects result in a reduction of groundwater pumping and recharge. The Department recommends revisiting the sections regarding specific yield and irrigation efficiency improvement projects to clearly identity how the SVIHM and water budget demonstrate a sustainable use of groundwater for all beneficial users. The Draft GSP needs to include a clearer explanation of the connection between groundwater that goes to surface water runoff and groundwater infiltration, or evaporation. Based on the information provided in the Draft GSP, it is difficult to understand these components of the SVIHM and water budget, the potential relationship with the surface water in GDEs, and how groundwater will impact species throughout the year. Once the GSA clarifies its understanding of these issues, the water budget should be adjusted accordingly and the Draft GSP should identify sustainable management criteria that prevent adverse impacts to beneficial users, such as dewatering of GDEs, and strive for long term groundwater sustainability with PMAs. The GSA should also consider developing PMAs that promote more efficient water use through water conservation where feasible. CDFW-022 CDFW-023

**Monitoring Network and Well Information**

GSPs must describe monitoring networks that can identify adverse impacts to beneficial uses of ISWs. (23 CCR § 354.34(c)(6)(D).) The Draft GSP should elaborate on the description the proposed monitoring network, which must be capable of collecting sufficient data to demonstrate short-term, seasonal, and long-term trends in groundwater and related surface water conditions as

required by SGMA regulations. The Draft GSP should clearly identify the wells used for monitoring, the locations of these wells, the aquifer unit, and specific well construction information (i.e., well completion depth) for the wells used. Chapter 3, Table 2 identifies wells designated for potential inclusion in the groundwater level monitoring and storage monitoring network as Representative Monitoring Points (RMPs); however, the map provided for these wells does not provide any designation (well identification) for the points shown on the map. The Draft GSP should include the well ID and associated information needed to assist in the evaluation of the proposed observation point for its potential to accurately characterize groundwater occurrence at that location. As reference, the data set should include the ground surface elevations for each well, reference point elevations for water level measurements, and important well construction information (i.e., well screen perforation intervals). CDFW-024

**Data Gaps and Use of the Best Available Science**

Per SGMA regulations, the Draft GSP must identify reasonable measures and schedules to eliminate data gaps. (23 CCR § 355.4(b)(2).) The Draft GSP does not contain a basin-wide groundwater-surface water model, analysis of the surface water depletion rate, or basin-wide groundwater monitoring, all of which are necessary to assess potential surface water depletions and impacts to beneficial surface water users, including Chinook Salmon, Coho Salmon, and Pacific Lamprey. The GSP also lacks quantitative criteria for instream flows (discussed more fully below), which are needed to assess compliance with SGMA and avoid significant and unreasonable depletions of ISW. The Department acknowledges data gaps may initially exist and may make development of certain criteria more challenging. However, the Draft GSP must set forth a reasonable pathway and timeline for addressing these data gaps and developing sustainable management criteria as required under SGMA, supplementing with models and other data if needed to address uncertainties in basin-specific data. CDFW-025 CDFW-026 CDFW-027

After conducting the necessary analysis and establishing appropriate criteria, the Draft GSP should be updated to consider and avoid any unreasonable adverse impacts to beneficial users anticipated to result from such depletions. GSP characterizes instream flows as "aspirational watershed goals" within sustainable management criteria. This characterization ignores the plain language of SGMA, which clearly indicates sustainable management criteria and objectives must be developed to avoid undesirable results within the planning and implementation horizon. (23 CCR §§ 354.24, 354.26, and 354.28.) CDFW-028

In addition, SGMA requires the assumptions, criteria, findings, and objectives of a GSP to be reasonable and supported by the best available information and best available science. (23 CCR § 355.4(b)(1).) The Department is aware of available information not being utilized to the fullest for the development of each sustainable management criteria and the water budget. Specifically, the GSP lacks consideration of current versus historic surface water extractions, agriculture ditch losses and gains, new or improved wells in the basin, and local springs that feed into Shasta River. In addition, the GSP fails to analyze data from Little Shasta River, a tributary of Shasta River, and may exclude smaller tributaries that regularly disconnect, including Willow and Whitney Creeks. These deficiencies in the analysis suggests the model may not be considering all relevant groundwater pumping and related impacts in the basin. Since SGMA requires sustainable management of the entire basin, the sustainable management criteria must take a basin-wide approach. The GSA should identify the data gaps, set basin-wide sustainable management criteria, and identify how the GSA will achieve a robust monitoring system to capture accurate information on these portions of the basin or use existing data to accurately model these portions and assess impacts.

CDFW-029

CDFW-030

CDFW-031

**Implementing Projects and Management Actions (PMAs)**

GSPs must include projects and management actions that are feasible and likely to prevent undesirable results and ensure that the basin is operated within its sustainable yield. (23 CCR § 355.4(b)(5).) The Department encourages and will make best efforts to support PMAs anticipated to address both immediate and long-term fish and wildlife resource needs. Not recognizing the role of the GSA to ensure sustainable management and deferring nearly all PMAs through an "integrative and collaborative approach" will make it difficult to achieve sustainability even by 2042 as contemplated under SGMA. The Department encourages the GSA to start working on PMAs like the reservoirs sooner than described.

CDFW-032

**Public Trust Doctrine and California Endangered Species Act**

The Department urges the GSA to consider its duties under the Public Trust Doctrine while developing its Draft GSP. While the SGMA sustainability requirements must be met within the 20-year planning and implementation horizon, Public Trust Doctrine requirements apply independently of SGMA, are not preempted by SGMA, and are applicable at all times. Under the Public Trust Doctrine, the GSA has the responsibility to consider potential impacts of its

groundwater planning decisions on navigable interconnected surface waters and their tributaries, and ISWs that support fisheries and ecological uses, including the level of groundwater contribution to those waters.[2] The 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 v. Alpine County Superior Court* (1983) 33 Cal. 3d 419, 446.)

It is not clear that the GSA has undertaken the analysis and consideration required under the Public Trust Doctrine to support its proposed PMAs and management criteria. Under *Audubon* and *Environmental Law Foundation*, the GSA must conduct a robust analysis that considers the needs of public trust resources and impacts to those resources due to the proposed groundwater management practices, and that clearly explains why protection of public trust resources is infeasible due to inconsistency with the public interest. As explained above, the GSA has yet to resolve significant data gaps relevant to the surface water depletion rate, basin-wide groundwater levels, and the presence and needs of GDEs and beneficial users of interconnected surface waters. These issues must be addressed to ensure appropriate consideration of the needs of public trust resources as required under the Public Trust Doctrine. CDFW-033

Based on an accurate understanding of public trust resource needs and impacts, the GSA will need to assess a range of potential protective measures to address impacts of groundwater extractions. These measures may need to go beyond the PMAs identified in the Draft GSP and may include pumping limits or alternative supply options to address existing, new, and expanded extractions. Given overallocation and ongoing drought, it is critical to plan for such eventualities in the Draft GSP. Before rejecting such measures, the GSA will need to engage in a balancing of competing interests that shows that protecting species and habitat though contingent pumping limits, use of supply alternatives, or equivalent protective measures would be infeasible. CDFW-034

Most critically, the GSA should consider the implications of its GSP development and implementation on species listed under the California Endangered Species Act (CESA). As previously identified in our April 28, 2020 letter, the highest priority recovery actions for protection of CESA threatened Coho Salmon include CDFW-035

[2] See, e.g., *People v. Truckee Lumber Co.* (1897) 116 Cal. 397, *National Audubon Society v. Alpine County Superior Court* (1983) 33 Cal. 3d 419, and *Environmental Law Foundation v. State Water Resources Control Board* (2018) 26 Cal. App. 5th 844.

increasing instream flows, increasing cold water input in the Upper Shasta basin, reducing overall water temperature, increasing dissolved oxygen, and reducing warm tailwater inputs to the stream. The current Draft GSP does not support all beneficial users including aquatic species like salmonids by not accounting for their needs in the sustainable management criteria and deferring the PMAs to a future date. In addition to the Department, the North Coast Regional Water Quality Control Board (Regional Water Board) provided a recommendation for an increase of 45 cubic feet per second (CFS) of cold water from the Big Springs Complex into the Shasta River. (Regional Water Board, 2006. Staff Report for the Action Plan for the Shasta River Watershed Temperature and Dissolved Oxygen Total Maximum Daily Loads. Chapter 6. Temperature TMDL.) According to their modeling analysis, this cold water is the most beneficial flow contribution in the Shasta River with respect to temperature and is critical for temperature TMDL compliance and support of the most sensitive beneficial uses the Regional Water Board identified in their analysis, which include cold freshwater habitat and spawning, reproduction, and/or early development of aquatic species. The Total Maximum Daily Load (TMDL) analysis provides clear evidence that these beneficial uses depend on supporting conditions provided by the recommended increase in cold groundwater, which in turn supports groundwater dependent ecosystems. These ecosystems may be currently threatened by unsustainable groundwater use. Additionally, the Temperature TMDL assigns load allocations for riparian shade and riparian areas are inherently groundwater dependent ecosystems. Actions may need to go beyond SGMA minimum requirements to meet Public Trust Doctrine requirements.

CDFW-035 contd.

CDFW-036

CDFW-037

The GSA has also suggested that it will defer PMAs for protection of Public Trust resources and CESA-listed species. Delaying these actions is not likely to ensure protection of public trust resources, particularly since ongoing groundwater pumping is causing significant adverse impacts to those resources. The GSA's proposal to spend the next 5 years increasing monitoring and fleshing out the outstanding sections of the GSP unduly delays tangible actions needed in the immediate term for protection of public trust resources.

CDFW-038

**SWRCB Emergency Regulations**

Per SGMA regulations, GSP minimum thresholds must be consistent with existing regulatory standards absent clear justification for differences. (23 CCR § 354.28(b)(5).) Emergency regulations approved by SWRCB on August 17, 2021, and effective on August 30, 2021, set forth minimum instream flows needed to avoid extirpation of certain fish species in the Scott and Shasta rivers during the

CDFW-039

current drought emergency. Per the SWRCB's Informative Digest, these emergency regulations are intended to preserve minimum instream flows for migration, rearing, and spawning of fall-run Chinook and SONCC coho salmon in the Scott and Shasta rivers during the current drought emergency. (pp. 21-22.) These regulations must be accounted for in the draft GSPs for the Scott and Shasta basins.

CDFW-039 contd.

However, the minimum instream flows set forth in the SWRCB emergency regulations are not intended to preserve all aquatic species in the Scott and Shasta rivers during all life stages, seasons, and water year types. The regulations merely set forth minimum instream flows that are needed to avoid extirpation of certain fish species during the current drought emergency. The Public Trust Doctrine requires the GSA to manage groundwater pumping in the basin to ensure instream flows in interconnected surface waters (e.g., the Scott and Shasta rivers) are maintained at levels that fully support all life stages of all fish species during all seasons and water year types when feasible. In certain seasons and water year types, this may require maintenance of additional flow beyond the minimum instream flows set forth in the SWRCB emergency regulations.

CDFW-040

The Department appreciates the opportunity to provide comments on the Draft GSP. If you have any questions, please contact Region 1 SGMA Coordinator, Brad Henderson, at Brad.Henderson@wildlife.ca.gov. Additionally, you can contact the Klamath Watershed Coordinator, Janae Scruggs, at Janae.Scruggs@wildlife.ca.gov .

Sincerely,

DocuSigned by:
Curt Babcock
974D273FEE784E2...

Tina Bartlett
Regional Manager

ec: California Department of Fish and Wildlife

Joshua Grover, Branch Chief
Water Branch
Joshua.Grover@wildlife.ca.gov

Robert Holmes, Environmental Program Manager
Statewide Water Planning Program
Robert.Holmes@wildlife.ca.gov

Angela Murvine, Statewide SGMA Coordinator
Groundwater Program
Angela.Murvine@wildlife.ca.gov

Curt Babcock, Environmental Program Manager
Region 1 – Habitat Conservation Planning
Curt.Babcock@wildlife.ca.gov

Joe Croteau, Environmental Program Manager
Region 1 – Klamath Watershed Program
Joe.Croteau@wildlife.ca.gov

Jason Roberts, Environmental Program Manager
Region 1 – Fisheries Program
Jason.Roberts@wildlife.ca.gov

Brad Henderson, Senior Environmental Scientist (Supervisor)
Region 1 – Habitat Conservation Planning
Brad.Henderson@wildlife.ca.gov

Janae Scruggs, Senior Environmental Scientist (Specialist)
Region 1 – Klamath Watershed Program
Janae.Scruggs@wildlife.ca.gov

California Department of Water Resources

Craig Altare, Supervising Engineering Geologist
Sustainable Groundwater Management Program
Craig.Altare@water.ca.gov

Pat Vellines, Senior Engineering Geologist
Sustainable Groundwater Management Program
Patricia.Vellines@water.ca.gov

National Marine Fisheries Service

Jim Simondet, Klamath Branch Chief
West Coast Region
Jim.Simondet@noaa.gov

State Water Resources Control Board

Natalie Stork, Chief
Groundwater Management Program
Natalie.Stork@waterboards.ca.gov

Erik Ekdahl, Deputy Director
Division of Water Rights
Erik.Ekdahl@waterboards.ca.gov

# COUNTY OF SISKIYOU

**Flood Control & Water Conservation District**

# Review Form

## Shasta Groundwater Sustainability Plan

---

Dear Reviewer,

Per SGMA requirements, a Groundwater Sustainability Plan (GSP) has been developed for the Shasta Valley groundwater basin. The GSA has released a complete draft GSP and has initiated a 45-day public review and comment period and seeks input from all beneficial users of groundwater.

**REVIEWER INSTRUCTIONS:**
Given the large number of reviewers, accommodating track changes or other editing options within the original draft sections distributed to all committee members is not possible. Please consider using this reviewer form with the following instructions:

- Use the form below to provide comments. Feel free to add additional lines to the form as needed.
- For suggested text changes, please copy and paste the text you wish to change and place your suggested edits in track changes or strikethrough features in this document. What's important is that technical staff can see *both* the original draft text and your distinct suggestions.
- Note the **Chapter, Page, Section, and line number**—from the ***PDF version*** of the draft GSP section—where your comment, question or suggested text edit begins.
- Examples of how to provide feedback are listed in the review form below. These examples are not actual comments and are made up to show how the table should be used. Feel free to delete these examples with your submission, and only include your feedback.
- To comment on a figure or table, in the line number column on the reviewer form note the figure number *and* the page number and type your comment in the text section to the right.

Please email comments directly to (sgma@co.siskiyou.ca.us). Include in the subject line the basin you are commenting on. If you are making comments on multiple basins, send as separate comments.

**Please send your comments no later than end of day September 26, 2021. Comments will not be accepter on or after September 27th, 2021.**

Please use the following file nomenclature in saving your review document:
*ShastaGSP_PublicReviewDRAFT_[Your name]_date*

Thanks for contributing to the draft Groundwater Sustainability Plan for the Shasta Valley Groundwater Basin

# COUNTY OF SISKIYOU

## Flood Control & Water Conservation District

Reviewer name: Scott Valley and Shasta Valley Watermaster District
Submission date: September 26, 2021
GSP sections reviewed:

| Chapter | Page | Section | Line/Table/Figure # | Comment (*please delete example text below once you submit*) | |
|---|---|---|---|---|---|
| 2 | 14 | 2.1.2.2 | Line 233 | Recommend: Amend to specify that "during dry seasons, groundwater springs in the Big Springs Complex provide an estimated 95 percent of baseflow to the lower Shasta River via the Big Springs Creek tributary" (Nichols et al, 2010). | SSWD-001 |
| 2 | 19-20 | 2.1.2.12 | 449 | Recommend: list BSID and MWCD separately, to identify them as the only irrigation districts that divert groundwater.<br>Comment: If the descriptions of SWRA and GID are to remain in the plan, need to make clear that these are adjudicated surface water users that are not subject to SGMA. | SSWD-002 |
| 2 | 20 | 2.1.2.12 | 450 | Correction Needed: BSID abandoned 25 of 30 cfs priority 24 from Big Springs Lake in a letter dated 6/18/1987 to DWR. BSID then abandoned the remaining 5cfs in a letter dated 12/17/1996 to DWR. Therefore, BSID has no active water rights from Big Springs Lake. | SSWD-003 |
| 2 | 20 | 2.1.2.12 | 451 | Question: what entity will manage BSID's groundwater diversion? | SSWD-004 |

| | | | | | |
|---|---|---|---|---|---|
| 2 | 20 | 2.1.2.12 | 454 | Correction needed: Please clarify that BSID does not divert surface water. Is the "surface water management" described here referring to their delivery system? | SSWD-005 |
| 2 | 20 | 2.1.2.12 | 456-462 | Correction needed: Please clarify that GID has surface water rights via the Shasta River Decree that are not subject to SGMA. Question: how/why will GID surface water management be incorporated into the GSP? | SSWD-006 |
| 2 | 20 | 2.1.2.12 | 472-476 | Correction needed: Please clarify that SWRA has surface water rights via the Shasta River Decree that are not subject to SGMA. Question: how/why will SWRA surface water management be incorporated into the GSP? | SSWD-007 |
| 2 | 23 | 2.1.2.16 | 519-530 | Comment: Thank you for editing this section from the previous draft. Lines 519-530 are now largely duplicative to lines 531-566, and could be deleted. | SSWD-008 |
| 2 | 24 | 2.1.2.16 | 567-568 | Comment: SSWD may be prohibited from providing this level of diversion detail due to privacy regulations. However, we can consult with legal counsel as to what type of aggregate data we could provide. | SSWD-009 |

| | | | | | |
|---|---|---|---|---|---|
| 2 | 78 | 2.2.1.5 | 1466-1468 | Comment: This statement is not accurate. Please provide supporting documentation for the Willis source. | SSWD-010 |
| 2 | 107 | 2.2.2.6 | 2087 | Recommend: Since Big Springs accounts for 95% of lower Shasta River baseflow during the irrigation season, please pursue research to address this data gap first, rather than the current research focus along the Little Shasta River. | SSWD-011 |
| 2 | 116 | 2.2.2.6 | 2209 | Correction needed: No surface irrigation diversions were occurring at the time of this study. Please edit this sentence to reflect this fact. | SSWD-012 |
| 3 | 6 | 3.3 | All | Comment: SSWD can assist in collecting data that will inform the "Depletions of Interconnected Surface Water (ISW)" component of the GSP. SSWD has a particular interest in addressing the SGMA undesirable result of "depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water" *Wat. Code § 10721(x)(1)- 93 (6).* | SSWD-013 |
| 3 | 14-17 | 3.3 | Table 1 | Recommend: Highly recommend adding ISW monitoring sites near known groundwater pumping locations. | SSWD-014 |

| | | | | | |
|---|---|---|---|---|---|
| 3 | 26 | 3.3.4.1 | 436 | STRONGLY RECOMMEND: Need to evaluate groundwater contributions to the Shasta River year-round, or at least before, during, and after irrigation season. | SSWD-015 |
| 3 | 29 | 3.3.4.1 | 474 | Recommend: SPU gage has value as indicator of surface water depletions, particularly immediately before and after the majority of groundwater pumps turn on in the spring. | SSWD-016 |
| 3 | 30 | 3.3.4.2 | 504 | Recommend: SPU is currently maintained by DWR and has been since 2013. Please include the data from this gage. | SSWD-017 |
| 3 | 31 | 3.3.4.3 | 513 | Recommend: Monitoring needs to occur prior to groundwater pumps turning on in the spring, in order to capture data to help determine how much groundwater pumping is depleting surface flows in the lower Shasta River. | SSWD-018 |
| 3 | 31 | 3.3.4.3 | 522 | Recommend: If groundwater level sampling only occurs twice per year, it should be done pre and post irrigation season. | SSWD-019 |
| 3 | 42 | 3.4.3.2 | 791 | Question: What are the identified reaches for ISW? Again, any useful ISW measurements need to be taken prior to, during, and after irrigation season. | SSWD-020 |
| 3 | 42 | 3.4.3.2 | 807-812 | Comment: Computing baseflows at SRM using this formula for gaging | SSWD-021 |

minimum thresholds during the irrigation season on a real-time basis can be very cumbersome and inaccurate due to all the variables involved including the large number of adjudicated and riparian surface water diversions between Dwinnell Reservoir and SRM, unknown surface and subsurface return flows from irrigation as well as the large flow travel time between these two sites which is estimated at about 18 hours at lower flows. For this method to be reliable, the flow at the upstream and downstream gages and the surface water and ground water diversions would have to be in a steady state at least 18 hours before the measurements as well as during the measurements. The watermaster would also need permission from the riparian diverters to measure their diversions along with the adjudicated diversions within a given day. Even so, this method does not account for the depletion of surface water due to ground water diversions.

SSWD-021 contd.

Given all the variables involved, SSWD recommends that minimum thresholds be determined for SPU and real-time baseflows be computed

| | | | | | |
|---|---|---|---|---|---|
| | | | | using the SPU gage instead of SRM. When baseflows are approaching minimum thresholds, only a few surface water diversions will be occurring between Dwinnell Reservoir and SPU, no riparian diversions exist, the flow travel time is only about 6 hours and as the available flow data for SPU indicates, the baseflow at this gage equals near 100% of the inflow to the Lower Shasta during low flow periods and the actual flow at this gage would be close to the baseflow. | SSWD-021 contd. |
| 3 | 43 | 3.4.3.2 | Table 7 | Correction needed: The SRM mean daily flow values for 2016 and 2017 in Table 7 do not agree with the USGS final data. These values should be 40.6, 48.8, 65.6, 67.4, 71.4 and 75.0 cfs, respectively. The flow values for 2018 – 2020 agree with the final data. Also, it appears that the terms "Baseflow" and "Groundwater Contributions" as used in Table 7 and Figure 10 are the same values, but this is confusing. | SSWD-022 |
| 3 | 45 | 3.4.3.4 | Table 8 | Recommend: SSWD recommends that the preliminary minimum threshold for baseflow be set at 115 cfs instead of 100 cfs and a trigger be | SSWD-023 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | set at 130 cfs instead of 115 cfs at SRM and that these values do not change depending on the year type. | SSWD-023 contd. |
| 3 | 45 | 3.4.3.3 | 849 | Recommend: using 115 as the minimum threshold. This is consistent with the recent SWB Emergency Drought Regulation. If the SGMA process doesn't address drought conditions, the SWB likely will.<br>Note: The recent SWB Emergency Drought Regulation included a schedule of water right priorities for both surface water and groundwater users. It would behoove the SGMA Team to include this in the GSP. | SSWD-024 |
| 3 | 47 | 3.4.3.6 | 932 | Recommend: CDFW will be installing a stream gage in Big Springs Creek, which is a major ISW area. Recommend including this gage into the monitoring network to provide real-time continuous flow data. | SSWD-025 |
| 4 | 6 | 4.1 | Table 4.1 | Correction needed: on Watermaster Tier 1: Please add first sentence: "Implements Shasta River Decree." Then, please replace "enforce" with "assists in managing." | SSWD-026 |
| 4 | 10 | 4.1 | Table 4.1 | Recommend: adding Tier 3 project titled "Coordinated Shasta Valley Irrigation Management," as a voluntary locally-led initiative | SSWD-027 |

| | | | | |
|---|---|---|---|---|
| | | | | amongst all water users to rotate diversions and employ other tools to keep more water instream and avoid additional regulations. Potentially led by SSWD or RCD. |
| 4 | 11 | 4.2 | 304 | Recommend: For new well permits, add a restriction of how close to surface water the well can be placed, based on modeling of if surface water will be depleted by well pumping. |
| 4 | 19 | 4.2 | 501 | Same recommendation as above. |

SSWD-027 contd.

SSWD-028

SSWD-029

## Perez-Reyes, Marisa

**From:** Matt Parker <mparker@co.siskiyou.ca.us>
**Sent:** Monday, September 27, 2021 8:07 AM
**To:** Perez-Reyes, Marisa; Duncan, Katie
**Subject:** FW: Draft plan comments
**Attachments:** Ch2.docx; Ch3.docx; Ch4.docx

-----Original Message-----
From: David Webb <Dave.webb@shastariver.org>
Sent: Sunday, September 26, 2021 8:51 PM
To: SGMA <sgma@co.siskiyou.ca.us>
Subject: Draft plan comments

Please accept the attached comments to the latest version of the SGMA plan.

We would like to have it noted that we are filing under protest, in that the entire document has not been available for the entire 45 days, and that some of it is still not available, hence we were not able to review either all that has been posted, nor the entire document since some is not posted at all. At eh same time, we do recognize that DWR seems to not be willing to allow additional time for completion and proper review.

FOSR-001

Thank you.

David Webb

# COUNTY OF SISKIYOU

## Flood Control & Water Conservation District

Reviewer name: David Webb for Friends of the Shasta River
Submission date: 9/26/2021
GSP sections reviewed: Chapter 2

| Chapter | Page | Section | Line/Table/ Figure # | Comment (*please delete example text below once you submit*) | |
|---|---|---|---|---|---|
| 2 | 8 | | 1 | The numbers appear to be for the entire watershed. They should be subsetted out for the management area only. | FOSR-002 |
| 2 | 9 | | 3 | Unclear what the X and Y axes are. There should be a link to an electronic version that can be downloaded and viewed at such a scale as to be meaningful | FOSR-003 |
| 2 | | | 450-4 | Check with Lisa Faris, but I think BSID has formally abandoned its right to Big Springs as a water source | FOSR-004 |
| 2 | 20 | | 466 | MWCD has a storage right to 35,000 af from the Shasta and ~14,000 af from Parks Creek, with no restriction on flow from the Shasta, and 150 cfs max from Parks Creek. And you should be more explicit about their gw usage since it has already been the target of an interference lawsuit. They pump gw from both the Pacy Wells and the Flying L pumps, and until the last few years their canal leaked to groundwater 20-30 cfs constantly when running full, which is now gone as a result of public funding for canal lining. Also MWCD has blocked public access to any of the data from the gauges below the dam, so they may not be worth mentioning. | FOSR-005 |
| 2 | 22 | | 494 | I don't think the SVRCD has had funding for operation of the Yreka Creek gauge for some years. Better check. | FOSR-006 |
| 2 | 23-4 | | 519-68 | This contains internal inconsistencies and errors, is overly long. Needs to be completely rewritten | FOSR-007 |
| 2 | 26 | | 637-45 | 2014 data should be updated from current county records. Additionally, note should be made that the reduced property tax income to the county has not been offset by state subvention funds since 2009. | FOSR-008 |
| 2 | | | 650-658 | This sections should include information on the impacts of the recently lost lawsuit where the county is now required to do CEQA analysis on new well permits, providing a basis for future gw demand management. | FOSR-009 |
| 2 | | | | | |

# COUNTY OF SISKIYOU

**Flood Control & Water Conservation District**

| | | | | |
|---|---|---|---|---|
| 2 | 27-28 | 660-701 | This illegal use needs to be put into perspective, with the range of water usage estimates converted to estimated acre feet, with comparison to other agricultural uses of groundwater in the Shasta Valley. The county is already under fire for claimed racist treatment of illegal growers. Not adding this perspective adds to that issue. | FOSR-010 |
| 2 | 28 | 712-19 | This could be a whole lot clearer. Rewrite please | FOSR-011 |
| 2 | 29 | 726-7 | This ignores the de facto replenishment from the extensive network of irrigation ditches. And it should be noted that public funding is steadily reducing that recharge through payments for pipelines and canal lining, both of which need to be factored into availability calculations going forwards from baseline years. | FOSR-012 |
| 2 | 30 | 738-69 | You really should mention the lahar forming the bulk of the flat portion of the Shasta Valley, and much of the gw basin, and which is responsible for forcing water in Pluto's cave basalt to surface as springs. | FOSR-013 |
| 2 | 35 | Fig 8 | Text of caption does not quite match illustration | FOSR-014 |
| 2 | 43-4 | 814- | Completely ignoring the lahar filling the Shasta Valley presents a very outmoded interpretation of surficial geology. See USGS Bulletin 1861 | FOSR-015 |
| 2 | 44 | 819-21 | It should be clearly noted that the Hornbrook formation does not yield potable or agriculturally useful water and serves as the lower extent of usable aquifer space | FOSR-016 |
| 2 | 48-9 | 975-980 | This needs to be re-written so as to be meaningful to the ordinary reader | FOSR-017 |
| 2 | 78 | 1480 | Range of data years not correct. | FOSR-018 |
| 2 | 85 | 1586-94 | For proper understanding, merely saying gw levels are stable doesn't impart the most important pieces of the picture. More accurate would be to say something along the lines that overall, full recharge occurs by the spring of each year, but because measurement are taken only spring and fall nothing is known about the timing or maximum depth of summer drawdown as it may be changing over time. | FOSR-019 |
| 2 | 86 | 1615-6 | It is also important for domestic uses which must be noted here. Additionally, the importance for fish should be further highlighted with the need for gw levels to be sufficiently high to sustain cold gw discharges in the stream bed and from springs feeding the river. Without that discharge no cold water fish habitat will survive, and its maintenance will necessarily serve to guide future gw management | FOSR-020 |

| | | | | |
|---|---|---|---|---|
| 2 | 86 | 1621-2 | Reference is made to section 2.3, which doesn't seem to exist. Why not go into gw storage here along with the following maps, rather than making a reader jump around? | FOSR-021 |
| 2 | 87-91 | figs | These figs would be improved if you added the east-west roads--HY 3, A-12, Louie Rd and Jackson Ranch Road. | FOSR-022 |
| 2 | 87 | Fig 35 | Elevations throughout should be converted to MSL also with a 2nd map set to show that, since surface elevation is highly variable, hence depth to water is largely meaningless, especially without surface elevation.. | FOSR-023 |
| 2 | 93 | 1627 ff | Mention in this background section needs to be made of the absolutely crucial role gw discharge to surface water plays on surface water quality in terms of temperature, and while gw temperature isn't going to change, reduction in gw discharge will/has negatively impacted surface water quality and placed an possibly insurmountable burden on surface water users in terms of meeting TMDL goals without integrating gw depletion into TMDL targeted efforts. | FOSR-024 |
| 2 | 94 ff | 1668 ff | You fail to provide any insight into the marked degradation in water quality resulting from extraction from the Hornbrook formation vs. overlying sediments. That degradation effectively makes the Hornbrook unsuitable for any current uses and limits water availability in the basin to those sediments overlying it only. | FOSR-025 |
| 2 | 94 | 1675-77 | In this section it is not clear, but it appears that what may have been done is approach the contamination question backwards--taking existing wells and using them as the basis for a monitoring plan. A proper approach would be to first determine what areas and constituents needed to be monitored, then looking to see if any existing wells were located where needed. If so, their usage would be appropriate Limiting investigations to only existing wells is completely faulty and needs to be done properly. | FOSR-026 |
| 2 | 95 | 1718 | Refers to Appendix 2-b, which is the correct title as posted, but the document itself is called Appendix C in the headers and title sheet. | FOSR-027 |
| 2 | 105 | 2055-59 | Surface diversion has an arguably greater impact on flow most of the year than any of the natural factors except winter floods. As such, to keep flow variation in perspective, irrigation diversion absolutely must be pointed out here as taking 90% or more of the total natural flow at times in nearly all summers, | FOSR-028 |

| | | | | |
|---|---|---|---|---|
| | | | | overwhelming other factors. |
| 2 | | 108 | 2095-8 | Data was presented to the consultants by representatives of the water master district strongly indicating that in 2020 considerable losses of surface water to groundwater was occurring between the CDEC gauges SPU and SRM. While not part of any planned study, the implications and magnitude are too great not to be mentioned here. Also important is that the apparent placement of the SRU transect near the apparent confluence of Julien Creek may have inadvertently left it influenced by stream underflow from Julien creek and its near-stream associated springs to the west of the Montague Grenada Road. As such, its findings should be clearly explained as not necessarily representative of any other portion of the river, and the data from between SPU and SRM should be included here to offset any misperceptions. |
| 2 | | 110 | Fig 46 | Need a more detailed location of transects please. |
| 2 | | | | |
| 2 | 120 ff, 126, | 2.2.2.7 | 2230, 2331-3 | The GDE screening use of DWR's identified irrigated areas in an effort to exclude man-made wet areas yields faulty results in that (in the words of UC Extension agent Dan Drake describing one such area in particular) there are irrigated areas of natural wetland which he described as " an irrigated swamp". That situation of rising groundwater creating small to large wetlands is relatively common in the Shasta Valley with its confused surface and subsurface geology, and the impossibility of fine-tuning flood irrigation to not irrigate such wet areas if the surrounding areas below the ditches need irrigation. Failing to identify and capture the seeps, springs, and wetlands effectively eliminates many early-warnings of declining groundwater, and will ultimately result in decreased surface flows. Many such areas are also irrigated, or surrounded by irrigated lands, making them impossible to identify by DWR. There needs to be further study, perhaps along the lines of performing remote sensing of leaf moisture content in the Fall of the year well after irrigation has ceased to identify areas with leaf moisture levels higher than surrounding areas, regardless of whether irrigation ditches are present near-by or not. Large areas meeting this description can be found south of the Parks Creek crossing of HY 99 and north of the Edgewood Exit , north of the Hy 3 crossing of the Shasta River, South of |

FOSR-028 contd.

FOSR-029

FOSR-030

FOSR-031

| | | | | |
|---|---|---|---|---|
| | | | the Montague-Grenada Road Crossing, and along a broad swath of the little Shasta west of Harry Cash Road and East of Montague, and elsewhere. In addition, the tiny maps in the document do not allow review of any specific areas for inclusion or exclusion and are useless eye candy. GIS data needs to be posted and accessible and also detailed PDF maps so the general public can draw proper conclusions. | FOSR-031 contd. |
| 2 | 130 ff | 2394-2400 | This appears to be saying that an acceptable depth to gw will be at the extreme end of the maximum depth of willow rooting, or even beyond. That provides no margin of error for climatic fluctuations, and ignores the necessity of water reaching the surface in order to allow seedling propagation. If this is correct, it is not at all conservative and needs to be reduced to some mid depth value for dry years, and near surface for wet years. The same applies further on for other gw dependent species also. If this is incorrect, the topic needs additional clarification please. | FOSR-032 |
| 2 | 133-3 | 2412-2433, fig 58 | Given the unique geology of much of the Shasta Valley, there needs to be some sort of validation that "*These grid or raster geospatial datasets were developed by interpolating between statistical representations of observed groundwater elevations for each three-year rolling period using data obtained from the California Statewide Groundwater Elevation Monitoring (CASGEM) Program using the well-establish kriging method*" can in fact be accurately used to interpolate between known points. Common methods won't always work in uncommon situations, and there is no discussion/documentation of their applicability in an area dominated by the largest volcanic lahar on the planet and with large areas of volcanic deposits which collectively funnel groundwater to the surface or restrict it below the surface in ways not consistent with conditions found in purely alluvial areas. See also lines 2679-82 in Chapter 2 confirming this complexity. Finally, depth to gw seems to be a relatively useless metric in an area of highly varying surface elevation, again as different from typically fully alluvial areas. All gw data should be also presented in height relative to mean sea level. | FOSR-033 |
| 2 | 135 | 2434-2437 | The processes described seem reasonable, assuming the data is accurate, but in fact it necessarily relies on multiple layers of approximations. As far as I know, | FOSR-034 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | elevation for most of the Shasta Valley is only available as 30 m digital elevation models (DEMs), making comparisons of measured depth to gw at one well location impossible to compare to depth to water at another potential GDE location, since the electronic surface elevations are not nearly sufficiently accurate at the elevations involved. As with the rest of the document, there isn't sufficient time to adequately research this other than to bring it up as an apparent problem. While the normal accuracy of 30 M DEM's is stated as "3.04 meters." It is followed by the following caveat "It is important to note that the vertical accuracy actually varies significantly across the U.S". Given the target depth for willow roots of 13', or 4 meters, there is ample room for mis-classification of all species. | FOSR-034 contd. |
| 2 | 136 | | 2504-09 | This paragraph claims the analysis (described in our prior comment above) describes "the maximum possible extent" of vegetated GDEs. As stated above, surface elevation data appears to be inadequate to support the analysis used, and hence the conclusion stated. It goes on to note that it is not a definitive determination, but the plan includes no sub sample analysis type project proposal to validate its accuracy, and instead will leave unknown acres unprotected. | FOSR-035 |
| 2 | 138-9 | | 2513-4, fig 60 and 61 | Sufficient data is not provided in appendix 2E as here stated. We have asked for numeric data used to produce the two figures, and the sources of that data and have received no response as of 9/26. This appears to be the validation period for the model, and a cursory look suggests multiple problems with the data assumptions built into the figures. Those problems cannot be evaluated without the above information. Included are: A static leakage value from canals despite ongoing canal lining, seemingly static lake leakage into gw, despite variable lake elevations and consequent leakage, increasing gw leakage into streams over time, despite expanding gw usage, and apparently unrelated to water year type, and no change in streams leaking into gw, despite presentation of data suggesting just that in the course of plan development.. | FOSR-036 |
| 2 | 143-5 | 2.2.3.2, 2.2.3.3 | Tables 13-18, 2637-2656 | Collectively these pages and lines describe values used in depicting annual water budgets for a ~20 year period from 1991-2018. No source of the data values sued is provided. No explanation is given for how the values are | FOSR-037 |

FOSR-037 contd.

prorated for the various water years, The absence of this sources and methods information makes proper review and commenting on all terms impossible. Other published data strongly suggests significant inaccuracies exist in the numbers used. This information was presumably used to calibrate and validate the model outputs. If so, the model itself needs to be re-configured: As an example, Appendix 2-B page 23 includes a map of the longer leaky ditches within the watershed. Looking at just one of those explicitly identified ditches--the Montague Water Conservation District Main Canal--A study by Willis and Deas in 2010 for the Montague Water Conservation District (District) determined that the canal lost 28 cfs on a continuous basis when running at capacity. That quantity over a 180 day irrigation season equates to 10.1 TAF. In table 13 and 14, the **maximum** value for canal leakage to gw for the entire GW basin and watershed both is listed as 10 TAF, less than the measured leakage from this one ditch alone, let along all the other major and minor ditches throughout the watershed. To offset this error, some other factor(s) must be proportionally smaller than what is real, and a model built to target those inaccurate numbers will necessarily predict poorly. The other values shown are not so easily disputed in the absence of more source information, but would seem to be equally suspect. This error is compounded by the District's ongoing efforts to eliminate that leakage, and they currently have ~ $4 million in public grant funds to complete the lining of the canal, with an obvious impact on gw supply. Nowhere does the model make mention of subtracting an appropriate amount of recharge to compensate for this loss. Instead it calls for spending more public money to duplicate the effect of leaky ditches with MAR type projects. A proper plan should address this. It is also worth noting that the District doesn't necessarily operate for a full irrigation season in a dry year, nor does the Grenada Irrigation District, which also utilizes an unlined canal reported in their own documents as losing as much as 12 cfs when full, making for what should be a dynamic amount of canal leakage to gw value in the water budget, while the chart shows it as essentially straight line amount through all water year types. It appears that numbers have been over simplified with unknown consequences.

| | | | | |
|---|---|---|---|---|
| 2 | 145 | 2605-7 | The word "enhanced" while technically correct, presents the opposite feeling than what is needed to characterize conditions. Exacerbated would be a better word. | FOSR-038 |
| 2 | 146 | 2708-10 | The reduction in discharge isn't caused solely by the absence of natural recharge, but is also reduced by GW pumping. Since this is a plan leading to management of gw usage, its impacts should never be ignored. | FOSR-039 |
| 2 | 146 | 2717-8 | This sentence should include not just reduction in precipitation , but also reduction in anthropogenic recharged, as from ditch and canal lining, projects which should include offsetting measures if publicly funded. | FOSR-040 |
| 2 | 146 | 2722-4 | The claim that climatic reductions in recharge will not cause overdraft is not supported by the identified consequences in these sentences--all of these are undesirable effects. GW usage and hence what constitutes overdraft is going to shift in harmony with gw supply in order not to cause a diminishment of surface flows. | FOSR-041 |
| 2 | 146 | 2724-2726 | This concept is not given proper adherence elsewhere in the document when talking about monitoring--The amount of decline in gw levels is going to be apparently related to a great degree to the underground flow rate/underground porosity. Nowhere is that factor captured in changes in gw elevation standards proposed. I.e. all wells are treated as equal in terms of % decline before requiring management action.. | FOSR-042 |
| 2 | 148 | 2797-8 | No factual basis is provided for this assertion. It should be removed here and elsewhere. | FOSR-043 |
| 2 | 150 | Fig 66 | This is too small to be useful. It needs to be available full sized electronically. The apparent if slight increase in discharge of gw into streams needs to be explained. Nowhere has that been done. | FOSR-044 |
| 2 | 151 | 2826-8 | Her and elsewhere this plan fails to recognize the critical role of gw in supplying cold water to the system, and the fact that existing usage levels are already significantly diminishing that cold inflow, jeopardizing attainment of the TMDL, further endangering coho salmon, and putting Fall Chinook salmon more at risk. | FOSR-045 |
| 2 | | 2826-8 | The claim that the sustained yield for the Shasta Valley is 42-45 TAF/year hasn't been substantiated anywhere. AS such it is an unsubstantiated assertion here | FOSR-046 |

| | | | | |
|---|---|---|---|---|
| | | | and absolutely needs to have its basis fully documented. That volume translates to 115-125 net CFS on a continuous basis for a 6 month growing season. That translates to 10,500-11,250 acres cropped with 4' of water per acre. In 2010 DWR estimated that approximately 10,200 acres were irrigated with just GW, an additional 1,230 acres were irrigated with a combination of surface and ground water, and no accounting was made of domestic use. At best there is no room for further expansion and that should be clearly noted. Also domestic use and illegal use needs to be factored in, along with planned reductions in gw irrigated acreages as recharge from canals is eliminated over time. We appear to have actually to have exceeded supply already, assuming that 115-125 cfs is even sustainable, which remaining instream flows say absolutely is not.. | FOSR-046 contd. |
| 2 | 151 | 2816-2822 | While the assertion that the basin is not in overdraft, the previous comments suggests we are right on the edge. Beyond that, the experience of people whose wells have gone dry suggests that the out dated definition that looks only at long term ability to regain a spring-time gw level completely fails to protect gw users in mid summer if heavy irrigation use draws down summer levels below well depths, yet winter precipitation and soil porosity is still sufficient to allow full recharge. Hiding behind this interpretation does the citizens of the county no good, and only highlights the failure of the count to allow designating special management areas to address those areas experiencing summer water shortages.<br><br>Reliance on this definition is a violation of state policy *" It is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes"* | FOSR-047 |

# COUNTY OF SISKIYOU

## Flood Control & Water Conservation District

Reviewer name: David Webb for Friends of the Shasta River
Submission date: 9/26/2021
GSP sections reviewed: Chapter 3

| Chapter | Page | Section | Line/Table/ Figure # | Comment (*please delete example text below once you submit*) | |
|---|---|---|---|---|---|
| 3 | 6 | | 155 | Appendix Z should read Appendix 3-A | FOSR-048 |
| 3 | 7 | | 167-74 | It would seem prudent to have these needed study items consolidated into a master PMA list to facilitate future funding. | FOSR-049 |
| 3 | 7 | | 178-93 | If the collection of the indicated data is needed, then there needs to be a fall-back approach identified to be utilized when/if voluntary measures fail to yield needed results. More detail is needed in terms of where the identified data is needed, at what well density, etc. | FOSR-050 |
| 3 | 8-11 | | maps | These maps are somewhat redundant, are too small to convey much useful information, and there is an excess of white space. The maps could be larger, and have key roads on them for helping know what is where. | FOSR-051 |
| 3 | 12 | | 221-5 | PMAs should be recognized as being made up of both actions taken, **and actions avoided/not taken.** The county has made it clear that any actions that will reduce existing gw usage are going to be stringently avoided--an example of actions deliberately not taken. Monitoring wells should be adequately distributed in areas where those actions avoided are likely to have undesirable impacts to adjoining gw users and or ISW. | FOSR-052 |
| 3 | 12 | | 236-7 | This sentence imparts no useful information. If it is supposed to be saying something it needs to be written. | FOSR-053 |
| 3 | | | 246-50 | Activities on the West side of the River need to be tracked and monitored separately from those on the East side. Likewise Pluto's Cave Basalt really needs its own monitoring plan with triggers and actions. | FOSR-054 |
| 3 | 12 | | 256-8 | While they may lack numeric data for depth to water over multi-years, the fact that domestic wells near A-12 are going dry should be treated as a long term trend if the owners can indicate that in past years no such problems existed | FOSR-055 |

# COUNTY OF SISKIYOU

**Flood Control & Water Conservation District**

| | | | | |
|---|---|---|---|---|
| | | | and as a result of declining water levels, now they do. With luck some or all of them will have a reliable depth to water at the time of drilling, to be compared to current problematic depths, providing an indication of long term trends. | FOSR-055 contd. |
| 3 | 18 | 281-4 | It would seem prudent to add to the list of projects the securing of extra well loggers to be standing by so that wells deemed potentially needed can be monitored on a preliminary basis and/or added immediately should they prove to be essential to proper management. they would also be good to have in the event of logger failure. | FOSR-056 |
| 3 | 18 | 286-7 | Given the importance of the wells supplying Lake Shastina, it seems like they should be immediately added to the monitoring network if the CSD is willing. Specific outreach to them is in order. | FOSR-057 |
| 3 | 18 | 288-90 | It seems likely that DWR guidance for well density is poorly suited to a volcanic area such as the Shasta Valley, with its convoluted and confused geology and hence hydrology. that should be clearly noted so as to allow finding funding for a greatly expanded monitoring network. | FOSR-058 |
| 3 | 22 | 305-8 | 2x annual monitoring may be good enough for some purposes, but protection of domestic wells in a meaningful fashion requires near-real time monitoring during critical periods. There should be a separate focus on meeting domestic needs in near real time, with monitoring, triggers and actions defined. | FOSR-059 |
| 3 | 22 | 318-21 | It appears that the SWGM cannot provide a numeric value for Storage as the text here states, but only an indication of whether it is increasing or decreasing or staying the same based on gw elevation. Is this correct? If so the language needs to be corrected. If not, additional information needs to be included in Appendix 2-E to explain how a model utilizing cross section data with an unknown boundary between usable water bearing strata and the Hornbrook formation, with seemingly no data known for subsurface porosity, and gw levels at the edge of the river varying from above and below stream water level, is able to estimate volume of groundwater. Perhaps an illustration. | FOSR-060 |
| 3 | 23 | 363-6 | Developing a plan based solely on what is available free or cheap seems arbitrary at best. It would be more appropriate to first develop an ideal plan, then see what if any existing wells approximate it. After that others need to be | FOSR-061 |

| | | | | |
|---|---|---|---|---|
| | | | secured. Having such a plan should facilitate securing funding for additional wells. | FOSR-061 contd. |
| 3 | 24 | 366-7 | This speaks to the need for equipment, specifically a down-hole camera to be used to capture screening details. Use of it might also help to further validate well logs, and cause those not accurate to be discarded from use. | FOSR-062 |
| 3 | 24 | 367-8 | USGS examined 21,400 well logs (as reported in USGS Bulletin 1766) in eh Central Valley, and found that only 590 of them had sufficient information on screening and water depths to be usable in assessing gw availability in the Central Valley--2.8%. We should expect no better here. A program needs to be established and funded where-by a trained geologist accompanies drillers to perform well logging in key areas when wells are being drilled there, along with a down hole camera to capture and/or validate well log information or add to it. | FOSR-063 |
| 3 | 24 | 381-2 | Does it matter if a well to take a water sample from is domestic or Ag? Might other parameters matter more especially water source depth and proximity to known or suspected sources of Water Quality problems? | FOSR-064 |
| 3 | 27 | 397 | It seems as if a plan should have sequential steps evaluated for relevance via the prioritization process, then organized into a table, making it clear that each is an essential step that is part of a well organized plan. This SGMA plan is long on explanation, which is good, but short on identified and organized action items. That really needs to be fixed. Here, there needs to be an action item explicitly committing to doing something specific with regards to adding more wells and/or drilling dedicated wells, or at least a process for deciding those details. | FOSR-065 |
| 3 | 27 | 408-10 | Section 3.3.4.1 really doesn't provide any enlightenment on where and how and how many additional wells will be selected. | FOSR-066 |
| 3 | 29 | Fig 6 | Description does not match illustration. Illustration needs to be made clear--is it hypothetical for the Shasta Valley, or data based? Does the table refer to the 70 cfs discharge or 35 cfs? | FOSR-067 |
| 3 | 29-30 | 487-95 | While this methodology could be able to work well given proper targets, there seem to be unrecognized issues that need to be resolved before it can hope to be reliable. First, aquatic organisms do not live on 2 year averages, or any | FOSR-068 |

| | | | |
|---|---|---|---|
| | | | other long term metrics. They live or die in the moment, depending on river flow, temperature, and dissolved oxygen levels. Properly protecting GDEs and ISW will require a real time monitoring and response process, not one apparently intending to look at 2 years of data prior to taking anything seriously, and even then perhaps not acting on those observations other than study them more. As a "Plan" this needs to recognize that reality and specify triggers and actions to be taken. Secondly, , many diverters, either by choice or at the direction of the water master do not divert their full water right continuously. Somehow that needs to be captured in a real time basis. At present that is not possible and needs to be created ASAP so as to utilize the full 5 year window. Third, from 20+ years of working with irrigators, developing irrigation efficiency studies, and educating myself on irrigation practices, it is painfully obvious that no one is 100% efficient. 50% is as good as is normally encountered. Persons with difficult to irrigate ground, or excessive water rights can do even worse. The excess water they apply is not consumed, and in instead generally finds its way back to the river, either very quickly as surface tailwater, or a little more slowly as subsurface return flow. The rapidity of those process can be visualized by the response of the river at the end of the irrigation season when the river rapidly rises to a static flow, but doesn't rise up then decline as diversion ceases and tailwater continues to supplement natural flow. Having the water master inform you of the gross diversion Q every 2 weeks is of little or no value in terms of determining surface depletion or meeting the minute by minute needs of aquatic systems. Somehow you will have to arrive at a real time value for ET in order to be able to know what the depletion is from surface diversion.<br><br>Finally, as a general observation the SPU gauge seems far more useful as an index of GW discharge to the stream from nearly all sources than would a complicated process of trying to work out a water balance with multiple users doing unpredictable things as the whim strikes them. FOSR-068 contd. |
| 3 | 30 | Table 4 | SV02 seems to be oddly placed to monitor GW levels for anywhere except very close to where it exactly is. I have seen no explanation as to why this FOSR-069 |

| | | | | |
|---|---|---|---|---|
| | | | location was chosen--it appears to have been arbitrarily selected on some other basis other than functionality. It is completely unclear how it can be expected to be representative of GW levels anywhere else, especially in areas where GW is discharging to the stream. Review of data from SRM and SRY suggest that about 5-10 cfs is added to stream flow between SRM and SRY in the absence of precip., suggesting that GW is of little significance between those two stations, especially when compared to the 70-150 cfs that discharges tot eh river upstream of SPU, where monitoring of gw levels would seemingly be far more useful. This site either needs to be fully justified vs. other potential sites, or some other site(s) than can be justified chosen. Given the acknowledges uncertainty of how best to properly manage gw in the absence of adequate information, it would seem far more sensible to monitor multiple sites in the expectation that one will be unpredictably better than he others, rather than arbitrarily settle on one location and hope for the best while waiting for 5 years to discover no useful information was gained. These observations are supported by lines 871-5 in this document, ch 3. | FOSR-069 contd. |
| 3 | 30 | 509-11 | While a target of 2032 may or may not be reasonable, I have not seen any specific steps identified that will make addressing the details of the Little Shasta any easier or more doable in 2032 than it is now. Data gaps, along with proposed steps that need to be taken to fill them need to be identified, along with a timeline for accomplishing them. | FOSR-070 |
| 3 | 31 | 513-521 | The validity of this approach isn't immediately apparent, and needs to be more fully developed and explained especially with regards tot eh rationales used. In >30 years of driving I-5 over Parks Creek, and always driving in the fast lane when going across the Parks creek bridge so as to be able to see the creek where it crossed the Mills ranch low water crossing under I-5. In all those years, I have never seen a no flow condition other than this summer. I question if it should be adopted at the expected target prior to initiation of monitoring. Both Parks Creek has spring flows both above and below the "dry reach", flow that is in large part diverted. Again, I am not sure exactly what is being tracked by this process. The Little Shasta has substantial flow upstream of the dry reach, again diverted, and possibly about to be supplemented by | FOSR-071 |

| | | | | |
|---|---|---|---|---|
| | | | 1707 water from the Hart Ranch. Again, just how this process yields useful information isn't clear. | FOSR-071 contd. |
| 3 | 31 | 522-3 | These two sentences seem contradictory--will the monitoring be continuous or 2x annually? | FOSR-072 |
| 3 | 35 | 599-605 | "Excessive" needs to be defined or described, as does "adverse". Without definition this section is meaningless. | FOSR-073 |
| 3 | 36 | 614-5 | Selecting as a target the drying up of domestic wells as an acceptable and anticipated outcome when it could be prevented by proper management and sharing of eh GW resource is not acceptable as a planned approach. I hope the people likely to be affected are outraged. Will your recommend red tagging homes with no water supply for that portion of the summer when there is none? | FOSR-074 |
| 3 | 36 | 638-42 | This 75th percentile and 10% buffer seems to be completely arbitrary, with no basis for determining if it is protective of all uses. Additionally, it appears that it would allow pockets of severe impacts to the functionality of most wells, as long as elsewhere in the watershed things were doing better enough to meet the 75th percentile overall. Given the complicated geologic conditions and substantial unknowns, this doesn't seem like an acceptable approach. Something more protective of domestic users along with GDEs and ISW needs to be selected, especially for the first 5 years. It needs to be recognized that all existing wells almost certainly have been adequate for meeting domestic needs for all years since they were drilled, until the last 2 years. That potentially decades long history shouldn't be ignored, just because a depth to water value is unknown. It is known that the depth to water was above the level of the pump until excessive extraction relative to supply occurred in 2020 and/or 2021. | FOSR-075 |
| 3 | 40 | 720-21 | The Shasta River jumps up within 2-3 days of the cessation of most irrigation on or before October 1, regardless of any precip. That flow is a direct measure of the then-impaired gw discharge to the stream. This sentence appears to belong in the Scott watershed, not the Shasta | FOSR-076 |
| 3 | 40 | 723 | This sentence appears to refer to the Scott River also. | FOSR-077 |
| 3 | 40 | 727-28 | This sentence appears to refer to the Scott River also. | FOSR-078 |

| | | | | |
|---|---|---|---|---|
| 3 | 41 | 751-2 | It needs to be noted that adverse impacts happen to junior water users in all or essentially all water year types (i.e. GID always gets curtailed sooner or later each summer). That is easy to document. Equally important, aquatic organisms are negatively impacted each year as a result of low flows, excessive temperatures, low levels of dissolved oxygen and passage barriers. The presence of those impairments should be sufficient to define a gw dependent ecosystem as in chronic overdraft during each summer and Fall. there is certainly no need to wait for 2 years in a row of some other impacts to make that determination. This has been the case since 1916, | FOSR-079 |
| 3 | 42 | 796-801 | The multiple deficiencies of this approach were described above. | FOSR-080 |
| 3 | 44 | 842 | Artificially imposing the "Fall Minimum" (plus buffer?) as an acceptable target is likely to result in reproductive failure when GDE plants generally need surface water for seed germination, followed by a slow decline in water level below the surface. This will potentially yield the same results as are seen in the Shasta River at eh beginning of the irrigation season when water levels unnaturally drop in advance of the release of willow seeds, effectively eliminating natural recruitment. | FOSR-081 |
| 3 | 44 | 844-5 | It seems unlikely that satellite imagery will be able to discern the above reproductive failure, but will instead track the presence of mature over story plants until they get old and die, with nothing to replace them. By that point cause and effect are likely to be unlinked in people's minds. | FOSR-082 |
| 3 | 45 | 849 | Again, selecting 100 cfs as the MT appears to be entirely arbitrary, especially given that Figure 10 shows that flows that low only occurred in one unusually dry year since 2010. At this point, there would seem to be sufficient data to select targets based on average conditions or past water year types for which we have data, pending the collection of more data, not the lowest number available. Setting a low number will only provide an opportunity to allow additional gw development to take place while the next 5 years pass, assuming they are normal water years and not a continuation of drought. Adding to the existing overdraft condition will only make future management harder. In the face of considerable uncertainty, a conservative approach should be taken. | FOSR-083 |

| | | | | |
|---|---|---|---|---|
| 3 | 45 | 856-7 | To be useful, it is necessary to know the surface elevation of the river closest to this well--what is it vs. the MSL elevation of the water target in this well? | FOSR-084 |
| 3 | 45 | 857 | This depth to water appears to preclude the establishment or survival of any GDE native to the Shasta Valley. Please explain how that relates to line 855. | FOSR-085 |
| 3 | 45 | Table 8 | Suddenly this table says the MT can now be 80cfs (20% less than 100 cfs). Nowhere is that mentioned nor justified. 100 cfs is already unreasonably low. This is bait and switch. If a 20% buffer is needed, then the MT should be set 20% higher than any acceptable minimum, or 125 cfs. | FOSR-086 |
| 3 | 45 | 864-8 | The importance of these lines is not clear and they need to be better explained. Historic data needs to be supplied for this well to allow the numbers presented to be evaluated. | FOSR-087 |
| 3 | 49 | 1003-4 | No adequate justification is provided for limiting water quality tracking to these tow constituents only. In addition, language in lines 1073-5 acknowledges that subsurface gw flows in any direction are possible in the presence of heavy gw pumping, potentially mobilizing naturally occurring contaminants from where they are naturally found to areas where they won't be expected nor looked for. Less frequent but periodic monitoring is needed to provide indications of this should it begin to occur. | FOSR-088 |
| 3 | 51 | 1096-7 | I have looked through the Harter reference, and can find no justification for the statement here to the effect that Shasta Valley CAFO stocking densities are not of concern. As such, that assertion is not supported by any facts and must be seen as arbitrary. Please provide a page number if I am mistaken. | FOSR-089 |
| 3 | 61 | 1349-51 | I was unable to find any such reference document. Please provide a proper link and/or title | FOSR-090 |
| 3 | | | | |
| 3 | | | | |
| 3 | | | | |
| 3 | | | | |
| 3 | | | | |
| 3 | | | | |
| 3 | | | | |
| 3 | | | | |

# COUNTY OF SISKIYOU

## Flood Control & Water Conservation District

Reviewer name: David Webb for Friends of the Shasta River
Submission date: 9/26/2021
GSP sections reviewed: Ch 4

| Chapter | Page | Section | Line/Table/ Figure # | Comment (*please delete example text below once you submit*) | |
|---|---|---|---|---|---|
| 4 | 2 | | 60-3 | The GSA should be explicitly identified as having responsibility for commenting both in favor and opposed to activities, both those brought to it for endorsement, and other publicly funded activities that further or retard GWMP goals | FOSR-091 |
| 4 | | | 80-5 | The plan fails to live up to this goal, particularly in regards to its failure to in any way acknowledge or address the absolutely essential role discharged groundwater plays in providing cold water refugia and in overall water temperature protection. | FOSR-092 |
| 4 | | | 88-9 | Again, as a responsible management agency the GSA should be prepared to speak up to both support and oppose future proposed activities. Merely staying silent on detrimental projects isn't acceptable. | FOSR-093 |
| 4 | | | 131-3 | I have not seen criteria for rejection of any project, just higher or lower scores, with no suggested threshold for rejection either as inadequately beneficial vs. cost, or likely to cause harm. That leaves the door open for "smokescreen" and "sweetheart" projects | FOSR-094 |
| 4 | 9 | | Table, row 2 | In addition to leasing, higher priority should be given to permanent purchase of water. Leasing is appropriate for temporary situations. These issues are not temporary. | FOSR-095 |
| 4 | 9 | | Table, row 3 | "irrigation efficiency" should never be given blanket endorsement--such projects often lead to an expanded irrigation footprint, reduction in anthropogenic recharge, and the transfer of "saved" water to more upstream junior users. Where mentioned language should include something along the lines of "carefully vetted" irrigation efficiency projects "scrutinized to assure no unintended consequences result". Particular scrutiny should be given to NRCS projects, in that NRCS is legislatively constrained to looking at only "on farm" impacts for the project recipient, not community, basin | FOSR-096 |

| | | | | |
|---|---|---|---|---|
| | | | wide or off farm unintended consequences. | FOSR-096 contd. |
| 4 | 10 | Table, row 2 | ILR sounds like a benign approach, but to the extent that it allows a diminution of gw discharge to the stream by replacing it with a similar volume of the mixed natural water and tailwater that constitutes current river flow, it undermines essential water quality needs and goals in terms of water temperature and potentially nutrient loading. It is often unlikely to be overall beneficial at meeting the combined water management goals the river must achieve from all regulatory agencies. | FOSR-097 |
| 4 | 10 | Table, row 3 | It is inappropriate to propose large physical project such as this without first doing a preliminary engineering study to document its likelihood of success. Nowhere is that essential first step proposed. | FOSR-098 |
| 4 | 10 | Table, Row 4 | This approach also needs to have a preliminary study and action plan in place well before any needed implementation so that actual implementation can be carried out in a fair and effective fashion, with minimal surprises or discussion-related delays. No such study and plan development is proposed anywhere, effectively preventing groundwater curtailment as a real option. | FOSR-099 |
| 4 | 11 | 211 ff | Significant portions of this project have been the subject of a Notice of Violation from the SWRCB for violation of state water law. It is an example of a (deliberately?) flawed examination of project details before investing money in preliminary studies, and/or the preparation of funding requests. Endorsing projects with illegal components undermines the credibility of the GSA and will impact the future effectiveness of it. | FOSR-100 |
| 4 | 12 | 225 | This project needs to be expanded, especially in the area between river mile 15.5 and 31 that becomes a losing reach over the course of the summer under current gw usage conditions. | FOSR-101 |
| 4 | 12 | 236 | As of 9/22 this appendix appears not to exist | FOSR-102 |
| 4 | 13 | 264-73 ff | Needing to be added here are projects to perform preliminary engineering studies of most Tier 3 actions, to complete instream flow studies so as to quantify the availability of "excess water" for storage projects or MAR, to define likely benefits of proposed MAR experiment, funding for water acquisition, funding for well installation to fill data gaps, funding for hiring a qualified geologist to accompany well drillers to prepare reliable well logs, | FOSR-103 |

| | | | | |
|---|---|---|---|---|
| | | | either local legislation requiring above geologist on wells, or incentive payment to landowner and driller for allowing geologist to log well while being drilled, funding or additional piezometer transects between rm 15.5 and 31, and elsewhere, studies to quantify accurately the recharge occurring from unlined ditches so as to respond appropriately as they become lined over time, studies to define underground transit times in various areas to set a foundation for evaluating recharge and water banking proposals, | FOSR-103 contd. |
| 4 | 14 | 309 | Add "canal leakage" to the list of recharge sources | FOSR-104 |
| 4 | 14 | 311 | Replace "lead to" with "are indicative of" | FOSR-105 |
| 4 | 14 | 321-23 | As noted elsewhere in the plan, gw usage has decreased the flows from Big Springs alone by approximately 1/2 ( ~60 cfs),, severely degrading the ability of the river to support groundwater dependent ecosystems, specifically cold water fish, or to support existing surface water users. This plan needs to acknowledge that failure to reverse, or partially reverse that impact will guarantee continued uncertainty and risk of litigation. Using as a stated goal the continuation of the current usage levels is not acceptable. | FOSR-106 |
| 4 | 14 | 328-9 | Comparing the 5 or 10 year average ET to the maximum ET observed between 2010 and 2020 will result in an increase in gw usage. It should be compared to the comparable average between 2010 and 2020; | FOSR-107 |
| 4 | 15 | 350 | To meet this standard, it isn't sufficient to minimize future extraction. It will also be necessary to reduce current extraction proportionately to identifiable reductions in recharge. Specifically, 8 miles of publicly funded canal lining by the Montague Irrigation District slated for completion in 2021, and is intended to reduce gw recharge by approximately 28 cfs continuously, during all periods when the canal is running full. Estimates and modeling were based on a time frame when that leakage was customarily part of the working gw system. See further comments on the topic in Ch2 comments. Other individuals and entities are similarly taking steps that will reduce their recharge, with no effort within this plan to track, offset, or oppose the substantial and measurable losses. | FOSR-108 |
| 4 | 16 | 402 | The unsubstantiated statement, that "Currently, there is no threat of chronically declining water levels in Shasta Valley" is not supported by any | FOSR-109 |

| | | | | |
|---|---|---|---|---|
| | | | preventative measures yet in place to limit gw extraction to its current levels, let along levels that would not result in undesirable results. In fact numerous domestic users are finding that they are increasingly without water as a result of declining water levels that is becoming more problematic each year. | FOSR-109 contd. |
| 4 | 16 | 403 | The unsubstantiated statement "the basin is not in an overdraft condition" here and elsewhere is in direct contradiction to data documenting that Spring flows in summer, as measured at Big Springs, have declined by ~ 60 cfs. That loss of cold water both where measured in Big Springs, and presumably from other springs fed by the Pluto's Cave Basalt has directly and adversely affected the ability of the river to support its most iconic GDE species--salmon, both coho and Chinook. Additionally, the decrease in gw discharge to the surface has directly impacted junior water users who are increasingly frequently curtailed by the water master. The presence of one or more undesirable results is the definition of an overdraft condition., The Shasta River meets that definition. All statements claiming not to be in overdraft condition should be removed. | FOSR-110 |
| 4 | 16 | 416-7 | The Shasta River is not a gaining stream at all times as a direct result o excessive gw pumping. Specifically, data has been presented to the project consultants by the water masters showing that the Shasta between River miles 15.5 and 31 became a losing reach by the end of the summer in 2020. Data for other years is not available, but since little has changed in terms of gw usage in 2020 vs. recent years, there is no reason to presume this has not been an ongoing condition. That data documenting the annual development of a losing reach in the river should be included as an appendix so the public can readily see and understand it, and support appropriate measures to address it. | FOSR-111 |
| 4 | 17 | 427 | Add the words "canal leakage" as another source of recharge. | FOSR-112 |
| 4 | 17 | 436-7 | The observation that gw levels slope from the basin margins towards eh Shasta River should color MAR concepts. MAR on the west side of the river (as is proposed herein elsewhere) will not benefit gw levels or users on the East side of the river, where identifiable shortages now exist. No explanation is provided as to why MAR is being proposed in this unfruitful | FOSR-113 |

# COUNTY OF SISKIYOU

**Flood Control & Water Conservation District**

| | | | | |
|---|---|---|---|---|
| | | | area. | FOSR-113 contd. |
| 4 | 17 | 446-7 | This statement conveniently ignores the other sources of recharge, specifically canal leakage and deep peculation from excess irrigation, reductions in both of which are currently and for years have been the focus of public and private pending. | FOSR-114 |
| 4 | 18 | 470-1 | This statement ignores the SGMA use of the presence of one or more undesirable conditions as the indicator of overdraft, an error made throughout the document. | FOSR-115 |
| 4 | 18 | 473-5 | Merely stating the existence of diminishing amounts of precip. isn't enough. Where is the response to this fact? Instead throughout the document there is a concerted effort to continue the slowly expanding and demonstrably excessive usage of gw, and to ignore the developing climatic trend that calls out for a conservative approach until climatic conditions prove otherwise. That is not a plan. at best it is an ex That is not a plan. at best it is an excise in wishful thinking. | FOSR-116 |
| 4 | 19 | 511 ff | Reliance on zoning seems misplaced, particularly with the proposed urban "partners" within whose jurisdiction little or no gw usage for irrigation occurs. Why is there no mention of a moratorium on the issuance of new well drilling permits for wells >6" diameter or similar county level actions that would immediately halt gw usage expansion, but instead pointing to a long, cumbersome and difficult process not likely to occur? | FOSR-117 |
| 4 | 19 | 518--box | Example 2--There is no existing nor proposed county staff position that will be monitoring agreements such as is described, nor is there a penalty nor other recourse if the agreement isn't adhered to. It is also unclear if this example agreement runs in perpetuity, or only for 10 years. | FOSR-118 |
| 4 | 22 | 558-60 | There should be an appropriate sharing of additional gw between gw users, surface users and GDEs. | FOSR-119 |
| 4 | 23 | 588-9 | The plan should note where this baseline data is located, and how it was calculated so that it can be independently verified over time. | FOSR-120 |
| 4 | 24 | 635-6 | Deliberately positioning the GSA to endorse someone's pet projects with little or no relevance to gw management is inappropriate. The GSA members have had many years of opportunity during which time they have | FOSR-121 |

| | | | | |
|---|---|---|---|---|
| | | | frequently met with the specific "other agencies" responsible for such projects. This is a transparent effort to enhance the fundability of projects that should stand on their own, and not deplete gw related funding. | FOSR-121 contd. |
| 4 | 24 | 641-4 | Irrigation efficiency improvements cannot be given a blanket endorsement. Each needs to be individually assessed to determine all its effects. As already pointed out, recharge from leaking ditches is substantial, and is relied upon unknowingly by many gw users in the basin, as is deep percolation. Reduction in those avenues of recharge need to be offset by equivalent reduction in gw demand. | FOSR-122 |
| 4 | 25 | 669-70 | Published University of California Extension Service research by Kuhn et. al. (*Juniper removal may not increase overall Klamath River Basin water yields*, California Agriculture, Volume 61, #4, 2007) suggests that gw benefits from this effort will be negligible. If it is undertaken as a gw management exercise, any benefits need to be documented by measured gw results, not by theoretical expectations. | FOSR-123 |
| 4 | 25 | 674 | Complete reliance on voluntary participation is at best disingenuous. There needs to be a fall-back method in place for when voluntary efforts are inadequate to generate needed data. Additionally, the existing well log based data base of existing wells is incomplete to an unknown degree. Without an accurate accounting of the total number of wells, evaluating the representative nature of any voluntary data will be impossible. There at minimum needs to be a method proposed for arriving at a count of total wells so that the representative nature and locations of any volunteered wells can be verified. One approach would be to secure from PP&L a total count of agricultural pump power drops, and subtracting from that the number of surface diversion pumps. | FOSR-124 |
| 4 | 26 | 724-6 | While stream flow augmentation by reducing diversions will yield desirable results, it cannot be overlooked that in addition to wet water ESA listed coho salmon require cold water, water already depleted by existing gw usage. Further planned depletion might well violate section 9 of the ESA. Given that, they cannot be accurately said to "effectively offset" an increase in gw usage. | FOSR-125 |

| | | | | |
|---|---|---|---|---|
| 4 | 27 | 766-9 | Use of the SWHM model for project assessment alone is not consistent with claimed plans to work with other agencies in that it has apparently no water quality component, most importantly for assessing temperature impacts on large and small refugia areas. Neither does it attempt to address minimum instream flow requirements. Project evaluation needs to be more appropriately comprehensive focusing on not reducing the likelihood of attaining all other mandatory water related targets, and in spreading any burdens fairly. | FOSR-126 |
| 4 | 27 | 771 ff | As presented, this appears to be a construction project, without first performing proper feasibility and preliminary engineering studies to document availability of "excess water", reasonable locations and size, potential costs, residence time, and reasonably expected benefits. If it is intended to be a preliminary study, then it should clearly be described that way only, with no fore-ordained outcome in terms of a physical project to follow, as it is currently described. It is worth noting that no mention of a gw shortage for **existing** gw users in the area identified have been made known at the advisory committee meetings. Beyond a project specific preliminary investigation, there needs to be the completion of an instream flow study in order to document the availability of excess water with which to do recharge on a regular enough basis to be useful. Proposed ownership of the stored water needs to be identified, as does its planned disposition, and how this meshes with the Grenada Irrigation Districts plans to initiate reliance on groundwater in lieu of river water so as to avoid water master curtailments. | FOSR-127 |
| 4 | 28 | 792 | There is no such thing in the Shasta Watershed as "excess winter runoff" in almost all years. | FOSR-128 |
| 4 | 31 | 931 | In essentially all years there are no excess winter and spring flows in the Shasta River given the presence of Dwinnell Res. and diversions from the Little Shasta. | FOSR-129 |
| 4 | 31 | 944-5 | This appendix doesn't seem to exist. | FOSR-130 |
| 4 | 33 | 1020 | This appendix doesn't seem to exist. | FOSR-131 |
| 4 | 32 | 991-97 | This information should be collected as part of a plan development project | FOSR-132 |

| | | | |
|---|---|---|---|
| | | | so as to be in place when needed. Existing well logs are known to be incomplete. An alternative count of production wells needs to be done, probably via securing from PP&L a count of irrigation power drops. That in turn would allow accurately assessing the level of incompleteness of the well log dataset. |
| 4 | 34 | 1055 ff | A project intended to generate geologically accurate well logs needs to be initiated. It could consist of paying for a qualified geologist to accompany well drillers as they drill new wells, and/or should include the drilling of dedicated wells to better characterize the subsurface geology and water bearing strata. It might be necessary to include incentive |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| 4 | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

FOSR-132 contd.

FOSR-133

MOUNT SHASTA BIOREGIONAL ECOLOGY CENTER
Honoring and Protecting our Mountain Environment Since 1988

September 26, 2021
To: The Siskiyou County Flood Control and Water Conservation District
re: Shasta GSP Comments
submitted via email to: sgma@co.siskiyou.ca.us

Thank you for the opportunity to comment on the Shasta Valley Groundwater Sustainability Plan.

The Mount Shasta Bioregional Ecology Center submits the following comments:

We believe that this current document, at its heart, will fail to address ongoing impacts to the public trust resources of the Shasta Valley. This plan de-emphasizes the fact that the Shasta River is in a perilous state due to agricultural diversions of surface water and over pumping of groundwater. MSEC-001

The Shasta River, as is described many times in the draft document, is intimately connected to the ground water in the basin. The river is listed 303(d) impaired for both temperature and dissolved oxygen. Many past assessments have described a river system that is heavily impacted by irrigation diversion of surface water and groundwater extraction. This summer agricultural users nearly de-watered the river and one of the lowest flow events ever recorded resulted (3.5 cfs at the Yreka gage).

We believe parts of this plan will serve to improperly establish baseline coverage of current practices, delay implementation of management actions, or even promote projects which could increase groundwater pumping. In doing so, the GSP seems to be designed to protect agricultural overreliance on groundwater in the Shasta River basin. MSEC-002

The GSP points towards an over reliance on future studies or future projects when it is evident that in order to consider groundwater sustainability in the Shasta Valley, one could simply consider only the agricultural water use during agricultural irrigation season. During the driest time of the year, agricultural use of interconnected surface water and groundwater vastly tips the water budget out of any semblance of sustainable. Once the irrigation season ends, groundwater recharge is rapid. MSEC-003

As this region has continued to experience more “very dry” years, it has become more and more apparent that there is simply not enough water during the summer months to MSEC-004

support current agricultural users, protect the public trust resources, and maintain suitable aquatic habitat for native salmonids.

The county remains averse to addressing the current conditions, minimizing the evidence that agricultural groundwater use plays an increasing role in pushing the Shasta Valley further from groundwater sustainability.

MSEC-004 contd.

We assert that generic projects in the preliminary list of PMA's aimed at "irrigation efficiency" or "flow management strategies/plans" (SHA's) will simply allow increased water consumption and expansion of irrigated acreages. None of these theoretical projects puts more water in the river or ground; they would simply ratify extractive water uses under a banner of "beneficial" use.

MSEC-005

This GSP does little to acknowledge the shifting considerations being made throughout state code which serve to address issues of racial and environmental justice (see SWRCB Racial Equity Initiative and the CA Fish and Game Commission working on an equity resolution and initiative). We have reached a critical moment in the evolving state regulatory structure where we must not only acknowledge the systemic tribal, racial, and environmental harms and injustices that have been propagated through land and water use laws, but we must now act to cease such harms. As such, by not addressing this, the plan will act to extend the historic "beneficial" use of water in Shasta Basin to grow food for cattle and only secondarily extend considerations to the environment or disadvantaged communities.

MSEC-006

With respect to developing, installing, and maintaining a modern monitoring system, we are troubled to see a shift in financing away from groundwater users and towards some notion that the whole county "benefits" from the cattle industry's continued overreliance on groundwater extraction. We do not think any taxpayers who reside outside of a specific basin should be asked to pay for any basin-specific monitoring network (tax increase). We believe that all monitoring equipment paid for with taxpayer money should be available in real time to the public. We believe that agricultural wells should be required to be metered for accuracy in reporting.

MSEC-007

MSEC-008

MSEC-009

MSEC-010

Overall, we would like to acknowledge the effort that has gone into this GSP. We hope that this document can remain buoyed by collaborative efforts and common goals and that it continues to evolve into a true guiding document for sustainable groundwater for all users in the Shasta Valley.

Nick Joslin
nick@mountshastaecology.org
Forest and Watershed Watch Program Director
Mount Shasta Bioregional Ecology Center

# Salmonid Restoration Federation

September 24, 2021

Ray Haupt, Chair
Siskiyou County Flood Control & Water Conservation District
P.O. Box 750
1312 Fairlane Rd.
Yreka, CA 96097

Submitted by email to: SGMA@co.siskiyou.ca.us

RE: Comments on Public Draft of Scott Valley and Shasta Valley Groundwater Sustainability Plans

Dear Chairman Haupt:

The mission of Salmonid Restoration Federation (SRF) is to promote restoration and stewardship of California's native salmon, steelhead, and trout populations and their habitat. We appreciate the opportunity to comment on the public drafts of the Groundwater Sustainability Plans (GSPs) for Scott Valley and Shasta Valley. We have briefly reviewed the GSPs and comments submitted by other entities.

We appreciate the County stepping up to lead development of the GSPs, and the tremendous amount of effort put into GSP development; however, we are disappointed by the contents of the GSPs. Our concerns fall primarily into two categories: 1) failure to properly characterize the adverse impacts on beneficial uses of the surface water caused by groundwater pumping, including a failure to propose actions that adequately address these adverse impacts, and 2) a lack of transparency which will severely impair the effectiveness of groundwater management.

The rivers and streams in the Scott and Shasta watersheds are severely depleted of water throughout large portions of each year. Due in large part to this flow depletion, salmon populations are in these two watersheds have declined precipitously from historical abundance over the past century and have continued their decline in recent decades and years. There are multiple factors contributing to this water depletion, including excessive diversion of surface water, excessive extraction of groundwater, and a warming climate that is diminishing snowpack and increasing the prevalence of droughts. Groundwater extraction from areas where wells can be regulated under SGMA are just one of these causes of flow depletion. Therefore, GSPs are not

SRF-001

425 Snug Alley, Unit D, Eureka, CA 95501 • *www.calsalmon.org* • *info@calsalmon.org* • (707) 923-7501

responsible for reversing the streamflow depletion caused by surface diversions or groundwater outside SGMA jurisdiction (e.g., wells near the mainstem Scott River, in the zone subject to surface water adjudication). However, the draft GSPs do not meet the SGMA requirements for addressing the impacts of groundwater extraction from wells inside SGMA jurisdiction.

SRF-001 contd.

SGMA requires that a GSP define minimum thresholds for streamflow depletion that cause adverse impacts on beneficial uses of the surface water, and then propose actions to ensure that such thresholds are avoided. Instead, the Scott Valley GSP does that process backwards, first defining actions that are easily achievable by groundwater users and then setting the minimum thresholds based on that. There is no consideration of the actual effects of streamflow depletion on surface water beneficial uses. This approach does not meet SGMA requirements.

SRF-002

The lack of transparency in the GSPs is troubling. Effective water management requires reliable data upon which to develop scientific understanding of how the hydrologic system operates, how the system is likely to respond to potential management actions, and ongoing monitoring to track progress in meeting goals. The methods and data used must be transparent and verifiable. There is currently a lack of basic information such as the amount of groundwater extracted. Neither the Scott or Shasta GSP require metering of groundwater extraction, nor public sharing of groundwater elevation data in a form that is transparent and verifiable (i.e., sharing the actual raw data rather than summaries). Without metering and data sharing, GSP policies such as "Avoiding Significant Increase of Total Net Groundwater Use from the Basin" are illusory and easy to game. In the absence of universal metering, the only other way to ensure avoiding increases in net groundwater use would be to not allow new well construction and not allow irrigation in areas not currently irrigated; however, the GSPs contain no such prohibition.

SRF-003

SRF-004

Thank you for your consideration of these comments.

Sincerely,

Dana Stolzman

Dana Stolzman, Executive Director
Salmonid Restoration Federation

Sept. 26, 2021

Siskiyou County Flood Control and Water Conservation District
1312 Fairlane Road
Yreka, CA 96097

Submitted via email : lauraf@lwa.com, katie.duncan@stantec.com, sgma@co.siskiyou.ca.us

**Re: Public comment letter for Shasta Valley Draft Groundwater Sustainability Plan**

Dear Dr. Laura Foglia, Matt Parker, GSA advisory committee, and technical team,

Shasta Headwaters is a forming coalition working to improve source water protection, resource conservation, and ecosystem restoration in Mount Shasta's three distinct drainages; the Upper Sacramento, McCloud and Shasta River watersheds.

These comments focus primary on effective Stakeholder Engagement to ensure that PMA implementation translates into equitable, reasonable and practical actions that encourage appreciation for ecosystems, and generate tangible benefits for marginalized stakeholders, as well as ongoing opportunities for improved stewardship at the local level. Though we have only conducted a cursory review the draft plan, we participated in multiple GSA meetings throughout plan formation. Thank you for compiling such a comprehensive initial draft, and incorporating these comments into the final plan.

Recovering from a century of extractive resource management, and reeling from another summer of extreme drought and wildfire, public stakeholders in Northern California are relieved that groundwater is finally about to be regulated. To preempt state intervention in local water management, and avoid the most deleterious threats of climate disruption, Siskiyou County must embrace the urgency of issues outlined in its GSP's, and the state must empower local water managers to adjust policies and practices to accommodate SGMA compliance.

Local grassroots organizations have participated in multiple collaborative efforts to conserve natural resources over the past few decades throughout the region. These include, but are not limited to: Renew Siskiyou - Climate Adaptation plan drafted in 2016, and the Upper Sacramento Integrated Regional Water Management (IRWM) Plan ratified in 2014. We have seen public and private funds spent on drafting smart plans, just to stagnate and collect dust on shelves. While the enforceability of SGMA is encouraging, we are concerned that without sufficient community buy-in and effective diverse stakeholder participation, GSP's will primarily serve to allocate corporate welfare to large land-owners, and continue current "regulatory" trends that broaden economic disparities and favor private over public interests.

SH-023

In general, the draft plan underestimates the Shasta River's immense natural values, and it understates its historical significance to the third most productive salmon-supporting river in the contiguous western United States, and largest river restoration project in the nation/world. The plan should convey a tone of pride, honor, and duty to protect and restore the remarkable natural heritage of the Shasta River. By framing the task at hand through a solution-oriented lens, the plan should clarify that a thriving, charged, salmon-laden Shasta River is the ultimate indicator of sustainable groundwater management throughout the valley.

SH-001

In addition to acknowledging its status as one of five priority anadromous fish spawning habitats by the state, we recommend:

- At the end of section 2.2.1.1 after line 784, emphasize how the valley's hydrogeology including its shallow grade, unique mineral deposits/chemical composition, and continual copious inputs of cold, clean, glacial-fed spring water made Shasta River prime salmon habitat, that historically boasted a significant majority percentage of salmon returning to spawn in the Klamath River system. SH-002
- Such hydrological conditions were guaranteed by consistent winter snowpack that is diminishing under current and projected warming. Please highlight how state and local water policy reform is necessary to adjust current practices to prospects of natural recharge, now and in the near future. SH-003

During one of the GSA sub-committee meetings, I inquired that since the ground-to-surface water interconnection is established, and it's common for the Shasta River to flow at a tiny fraction of its naturally occurring volume, how can the basin not be overdrafted? The team provided a lengthy explanation that sounded like technically, the basin may not be in overdraft. But practically speaking, a month later the state issued emergency drought curtailments to irrigators throughout the basin for the first time ever. If the basin is not in a state of overdraft, while the river that defines the basin is routinely getting dewatered, perhaps we need to redefine overdraft? SH-004

- I was unable to find an explanation of what constitutes overdraft in the draft plan. Please point me toward it, or include it as point of discussion/clarification.

The plan also underestimates the power of coordinated, widespread, voluntary conservation efforts, grassroots stewardship, and community buy-in. We urge you to include more meaningful opportunities for public interest representation, as well as Tribal leadership. SH-005 In addition to establishing a monitoring network and making important water information available to the public, we recommend: SH-006

- Include residential, municipal, and small agricultural water conservation education to the list of Tier I or II PMA's. SH-007
- Incorporate a mechanism for generating diverse stakeholder consensus on PMA prioritization and implementation. SH-008
- Include Friends of Shasta River in the Table 1 list of Shasta Valley Stakeholder Groups as an environmental organization or local NGO. SH-009
- Provide financial support for Tribal and/or environmental stakeholder leadership during plan implementation and maintenance. SH-010

Data access and water-use accountability are essential for sustainable water management. The plan does a good job of acknowledging the lack of existing data used to inform water use throughout the region. In addition to bridging data gaps, we urge the GSA to pay more attention to making better use of data we do have, and synthesize the many avenues of watershed data monitoring into a comprehensive, user-friendly, consistent data management system. SH-011

We applaud the significant expansion of acreage that was included into the basin under the initial boundary modification, and we are aware that unlimited, unmonitored uses upstream may intensify conflicts between farmers and fish advocates downstream. We recommend:

- Coordinate PMA implementation among the four basins; Shasta, Scott, Butte, Tule Lake. SH-012
- Consolidate resources – combine the multiple water conservation/irrigation/service districts into one comprehensive Shasta River watershed authority. SH-013
- Coordinate data monitoring and plan performance between GSA's and Integrated Regional Water Management (IRWM) groups operating in Siskiyou County. Specifically, the North Coast Resource Partnership and the Upper Sacramento Regional Water Action Group (RWAG). SH-014
- In the "upslope water yield projects' category, include a mechanism for monitoring non-beneficial, industrial extraction. SH-015
- Include incentives for switching to less water-intensive crops, and adopting regenerative agricultural practices in Tier I or Tier II PMA's SH-016
- Identify periodic updates of Bulletin 118 as an opportunity to mandate monitoring of unregulated groundwater upstream. SH-017

Distributing powers of authority to local jurisdictions is an important step toward long-term sustainable water management. Impediments to sustainability, however, often exist at the state level. For GSA's to achieve SGMA compliance, regional, state, and local jurisdictions must remedy glaring obstacles to watershed stewardship, such as:

- Revisit and revise overly-complicated, fragmented, outdated, profit-motivated water management policies, and over-allocated water rights. SH-018
- Over-regulating small business, while under-regulating big business thereby pitting farmers against fish, while industrial users deplete dwindling supplies. SH-019
- Streamline permit processes and provide incentives for the deconstruction of impoundments that are not subject to FERC, but have outlived their useful lives. SH-020

For California to recover from climate disruption, and for communities to minimize exposure to incessant drought, the state must shift our water ethics from "use it or lose it" to "less is more". GSP's should allocate a substantial percentage of SGMA grant funds to management actions SH-021 that reward behavioral alternatives to wasteful water use, across sectors. Business-as-usual is threatening basic conditions for quality of life, enabled by many decades of neglecting the complicated task of regulating groundwater. In order for GSA's to achieve desired results, stakeholders must do more than meter wells and monitor groundwater elevation. We must learn to appreciate ecosystem services, limit consumptive uses that primarily benefit private interests, invest downstream stakeholders in protecting supplies upstream, restore biodiversity habitat, and heed traditional ecological knowledge. SH-022

Overall the plan is a refreshing consolidation of relevant data that is long overdue in a modern, democratic society. While we are mindful of California's tendency to talk more than it walks, we also recognize this unique opportunity to galvanize shared interests around common goals. In short, we are tentatively hopeful that SGMA will provide a reliable platform for protecting communities against wildfire and drought by restoring a healthy Shasta River watershed.

Respectfully,

Angelina Cook
(530) 859-2083
angelina@shastaheadwaters.com

**UNITED STATES DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1655 Heindon Road
Arcata, California 95521-4573

**Refer to NMFS No:** AR#10012WCR2021AR00040

September 23, 2021

Matt Parker, Natural Resources Specialist
Siskiyou County Flood Control and Water Conservation District GSA
1312 Fairlane Drive
Yreka, California 96097

Re: NOAA's National Marine Fisheries Service comments on the Shasta Valley Groundwater Sustainability Plan -- draft GSP

Dear Mr. Parker:

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

On August 11, 2021, the Siskiyou County Flood Control and Water Conservation District GSA - Shasta River (SR GSA) released their draft GSP of the Shasta Valley Goundwater Sustainability Plan (SV GSP). Waterways that overlie portions of the Shasta Valley Basin (*e.g.*, Shasta River and tributaries) support federally threatened Southern Oregon/Northern California Coasts coho salmon (*Oncorhynchus kisutch*), as well as Chinook salmon (*O. tshawytscha*) and steelhead (*O. mykiss*). This letter transmits our comments on the draft GSP.

We previously commented on draft Chapters 3 of the SV GSP . However, many of those comments do not appear to have been considered by the SV GSA, so we have reiterated them in this letter. In the future, we recommend the SR GSA compile a publicly available summary of comments received on the SV GSP, along with the GSA's response to each comment. NMFS-001

**Comments**

Page 16, Figure 1: The chosen monitoring wells are generally located too far from waterways to adequately analyze and monitor streamflow depletion. We recommend the SR GSA develop a plan for installing paired streamflow gauges and groundwater monitoring wells located in close proximity to each other. These monitoring points should be strategically located throughout the basin where potential streamflow depletion impacts are likely occurring. NMFS-002

Page 25, line 426: The draft GSP proposes monitoring groundwater contributions to the Shasta River during the "irrigation season", yet does not explain why monitoring is limited to this season only. Streamflow depletion does not usually occur instantaneously with the causative groundwater pumping, but can instead be delayed by days, weeks, months or years (Barlow and Leake 2012). For instance, groundwater pumping during the irrigation season could deplete streamflow when adult coho salmon are migrating in December, well after the irrigation season. To account for this temporal variability, streamflow depletion and augmentation monitoring should occur year-round. NMFS-003

Page 25, line 439: The proposed protocol for monitoring interconnected surface water dynamics pairs streamflow gauging data collected at 15 minute intervals with bi-monthly surface water diversion data. The low frequency with which surface water diversion data is collected may hinder the intended analysis; we suggest gathering data on surface water diversions more frequently to alleviate this concern. NMFS-004

Page 25, Table 4: As alluded to above, a grand total of four monitoring locations within the Shasta Valley is likely insufficient to characterize interconnected surface water dynamics. NMFS-005

Page 25, line 449: Waiting until the 2032 GSP update to begin monitoring the upper Little Shasta River watershed is not appropriate, given that a 2032 start date leaves just 10 years to address streamflow depletion impacts prior to the SGMA deadline for achieving sustainable groundwater management. The SR GSA should design a plan now to gather the required data so that significant progress can be achieved at the first 5-year check-in in 2027. NMFS-006

Page 35, line 663: The draft GSP lists potential impacts resulting from streamflow depletion as diminished agricultural surface water diversions, and inadequate flows to support riparian health and ecosystems. The list should also include impacts to ESA-listed salmonids and their habitat that depend on significant groundwater accretion to maintain habitat suitability. NMFS-007

Page 35, line 676: Growth in groundwater demand that changes the distribution of pumping and volume pumped cannot be characterized as "unforeseen", since the GSA is responsible for managing current and future groundwater extraction, and SGMA gives broad power to GSAs to accomplish that task. NMFS-008

Page 36, line 694: The draft chapter forgoes developing a groundwater/surface water analytical model as required under SGMA, and instead proposes using an analysis that uses the location, quantity and timing of interconnected surface water. The analysis focuses on the months of July through September based upon the lack of surface water input at that time of year. However, streamflow depletion impacts to beneficial uses of surface water, and specifically ESA-listed salmonids and their habitat, is not restricted to that time period. For instance, juvenile coho salmon migrate out of the Shasta River watershed during the spring months, well before July, and rearing juvenile coho salmon and steelhead inhabit the Shasta River throughout the year. Furthermore, the streamflow depletion response to groundwater pumping is not likely instantaneous, but can vary from days to months or years depending on factors such as aquifer composition, pumping depth, and other factors. NMFS recommends the SR GSA develop an NMFS-009

integrated surface water/groundwater analytical model considering the inherent complexity of Shasta River hydrogeology.

NMFS-009 contd.)

Page 36, line 704: For computing groundwater contributions during the irrigation season, riparian diversions are estimated at 20 cfs throughout the growing season. However, the following sentence states that riparian diverters do not continuously divert flow. The plans approach is to use a 2/3 of the 20 cfs estimate**.** How was this estimate determined?

NMFS-010

Page 37, top paragraph: Another uncertainty that requires acknowledgement is the sparse gauging network proposed for the "water balance" analysis. Using just two surface water gauges to characterize discharge within the groundwater basin is clearly inadequate for a number of reasons. For instance, both gauges are located on the mainstem Shasta River, with none located on tributary reaches. Also, the two existing gauges are separated by approximately 10 miles of river channel. Finally, the proposed addition of a future monitoring site (SPU on Figure 3) between the two gauges, while a worthwhile effort, does not address the lack of tributary gauges.

NMFS-011

Page 39, Line 743: There appears to be no justification given as to how a minimum threshold of 100 cfs of average monthly groundwater contribution avoids significant and unreasonable impacts to surface water beneficial uses caused by groundwater pumping. NMFS recommends the SR GSA include this justification.

NMFS-012

Page 39, line 754: As discussed earlier, focusing sustainable management criteria on the irrigation season is unlikely to adequately account for the spatial and temporal scale of groundwater/surface water interaction within the Shasta River basin. A groundwater/surface water analytical model is the appropriate tool for this type of analysis.

NMFS-013

How is the CDFW Water Action Plan streamflow prescriptions going to be worked into the GSAs streamflow depletion SMCs?"

NMFS-014

We hope these comments effectively clarify important concerns we have regarding potential significant impacts to SONCC coho salmon, Chinook salmon, and steelhead likely to result from the draft Chapters 3 of the Shasta Valley Basin GSP. If you have any questions, please do not hesitate to contact Rick Rogers (707-578-8552, or Rick.Rogers@noaa.gov) for further assistance.

Sincerely,

Jim Simondet
Klamath Branch Supervisor
California Coastal Office

cc: Janae Scruggs, CDFW Senior Environmental Scientist Specialist (janae.scruggs@wildlife.ca.gov)

Joe Croteau, CDFW, Supervisor

Pat Vellines, SGMA Point of Contact Scott Rive Valley Basin (Patricia.Vellines@water.ca.gov)

Natalie Stork, SWRCB Chief -- Groundwater Management Program (Natalie.Stork@waterboards.ca.gov)

Craig Altare, DWR Chief, GSP Review Section (craig.altare@water.ca.gov)

References

Barlow, P.M., and Leake, S.A. 2012. Streamflow depletion by wells—Understanding and managing the effects of groundwater pumping on streamflow: U.S. Geological Survey Circular 1376. 84 pages. Available at: http://pubs.usgs.gov/circ/1376/).

The Nature Conservancy | Audubon California | Local Government Commission — Leaders for Livable Communities | Union of Concerned Scientists — Science for a healthy planet and safer world | Clean Water Action | Clean Water Fund

September 26, 2021

Siskiyou County Flood Control and Water Conservation District
1312 Fairlane Road
Yreka, CA 96097

*Submitted via email: lauraf@lwa.com; katie.duncan@stantec.com; sgma@co.siskiyou.ca.us*

**Re: Public Comment Letter for Shasta Valley Draft Groundwater Sustainability Plan**

Dear Laura Foglia,

On behalf of the above-listed organizations, we appreciate the opportunity to comment on the Draft Groundwater Sustainability Plan (GSP) for the Shasta Valley Basin 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 Shasta Valley 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" |

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

Best Regards,

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

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

Samantha Arthur
Working Lands Program Director
Audubon California

Danielle V. Dolan
Water Program Director
Local Government Commission

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

Melissa M. Rohde
Groundwater Scientist
The Nature Conservancy

# Attachment A

**Specific Comments on the Shasta Valley 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, 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 states that there are five DACs in the basin, but these areas are not mapped and the population is not provided. — NGO-001
- The GSP provides a map of domestic well density in Figure 4, but fails to provide depth of these wells (such as minimum well depth, average well depth, or depth range) within the basin. — NGO-002
- The GSP fails to identify the population dependent on groundwater as their source of drinking water in the basin. Specifics are not provided on how much each DAC community relies on a particular water supply (e.g., what percentage is supplied by groundwater). — NGO-003

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

**RECOMMENDATIONS**

- Provide a map of the DACs in the basin. The DWR DAC mapping tool[1] can be used for this purpose. Include the population of each DAC in the GSP text or on the map. — NGO-001 cont.
- Include a map showing domestic well locations and average well depth across the basin. — NGO-002 cont.
- 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). — NGO-003 cont.

[1] The DWR DAC mapping tool is available online at: https://gis.water.ca.gov/app/dacs/

**Interconnected Surface Waters**

The identification of Interconnected Surface Waters (ISWs) is **insufficient**, due to lack of supporting information provided for the ISW analysis. To assess ISWs, the plan relied on previous reports by Shasta Valley Resource Conservation District (SVRCD) and an on-going transect study for the Little Shasta River and Shasta River to determine the direction of flow exchange. The transect study commenced in May 2020. NGO-004

The GSP states (p. 2-105): "The Shasta River and its major tributaries are all considered part of the interconnected surface water system in the Basin." Figure 43 maps streams in the basin, but only shows Shasta River and Little Shasta River as being interconnected. No other data is presented in this section of the GSP, including depth-to-groundwater data and well locations.

**RECOMMENDATIONS**

- Describe available groundwater elevation data and stream flow data in the basin. ISWs are best analyzed using depth-to-groundwater data from multiple seasons and water year types (e.g., wet, dry, average, drought), to determine the range of depth and capture the variability in environmental conditions inherent in California's climate. NGO-005
- Overlay the stream reaches shown on Figure 43 with depth-to-groundwater contour maps to illustrate groundwater depths and the groundwater gradient near the stream reaches. Show the location of groundwater wells in the basin. NGO-006
- 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. NGO-007
- On the stream reaches map (Figure 43), consider any segments with data gaps as potential ISWs and clearly mark them as such on the map. NGO-008
- Describe data gaps for the ISW analysis. Reconcile these data gaps with specific measures (shallow monitoring wells, stream gauges, and nested/clustered wells) along surface water features in the Monitoring Network section of the GSP. NGO-009

**Groundwater Dependent Ecosystems**

The identification of Groundwater Dependent Ecosystems (GDEs) is **insufficient**, due to lack of clarity around the monitoring well data (well location and screen depth) used to map groundwater elevations and depth to groundwater. The GSP references TNC Best Practices for using the NC Dataset (2019) as the approach used to map depth to groundwater, using the difference between land surface elevation and interpolated groundwater elevation above mean sea level. However, the GSP does not further describe the monitoring well data (well location and screen depth) used to create the depth-to-groundwater maps presented in Appendix 2-H. NGO-010

The GSP took initial steps to identify and map GDEs using the Natural Communities Commonly Associated with Groundwater dataset (NC dataset) and other sources. However, we found that some mapped features in the NC dataset were improperly disregarded, as described below.

- NC dataset polygons were incorrectly removed in areas adjacent to irrigated fields due to the presence of surface water. 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 can still potentially be reliant on shallow groundwater aquifers, and therefore should not be removed solely based on their proximity to irrigated fields. NGO-011

- NC dataset polygons were incorrectly removed based on the amount of time that they access groundwater. As presented in the GSP, assumed GDEs have access to groundwater >50% of time and assumed non-GDEs have access to groundwater <50% of the time. However, NC dataset polygons should not be assumed to be disconnected if there is any connection to groundwater (regardless of temporal percentage). Many GDEs often simultaneously rely on multiple sources of water (i.e., both groundwater and surface water), or shift their reliance on different sources on an interannual or inter-seasonal basis. NGO-012

**RECOMMENDATIONS**

- On the depth-to-groundwater level maps presented in Appendix 2-H, include the location of groundwater monitoring wells used to produce the maps. Discuss screening depth of monitoring wells and ensure they are monitoring the shallow principal aquifer. Change the vertical scale such that shallow groundwater elevations are presented more clearly. For example, change the largest depth on the scale to a depth of 100 or 200 feet (instead of 3000 feet). The manner in which the depths are presented make it very difficult to distinguish between depths ranging from 0-100 feet, which is the depth range pertinent to GDEs. NGO-013

- Use depth-to-groundwater data from multiple seasons and water year types to verify whether polygons in the NC Dataset are supported by groundwater, instead of the incorrect criteria mentioned above (presence of irrigation water or less than 50% time connected to groundwater). Instead of using groundwater elevation data from 2011 - 2020, we recommend the pre-SGMA baseline period of 2005 - 2015. NGO-012 cont.

- 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. NGO-011 cont.

**Native Vegetation and Managed Wetlands**

Native vegetation and managed wetlands are water use sectors that are required[2,3] to be included into the water budget. The integration of native vegetation into the water budget is **insufficient**. The water budget did not explicitly include the current, historical, and projected demands of native NGO-014

[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]

vegetation. The omission of explicit water demands for native vegetation is problematic because key environmental uses of groundwater are not being accounted for as water supply decisions are made using this budget, nor will they likely be considered in project and management actions. Managed wetlands are not mentioned in the GSP, so it is not known whether or not they are present in the basin.

NGO-014 cont.

NGO-015

**RECOMMENDATIONS**

- Quantify and present all water use sector demands in the historical, current, and projected water budgets with individual line items for each water use sector, including native vegetation.

NGO-014 cont.

- State whether or not there are managed wetlands in the basin. If there are, ensure that their groundwater demands are included as separate line items in the historical, current, and projected water budgets.

NGO-015 cont.

## 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[4] is not fully met by the description in the Stakeholder Communication and Engagement Plan included in the GSP (Appendix 1-A).

The GSP describes outreach to tribal and environmental stakeholders in the basin and states that members of these groups are on the Stakeholder Advisory Committee. However, we note the following deficiencies with other aspects of the stakeholder engagement process:

- The opportunities for public involvement and engagement are described in very general terms. They include attendance at public meetings, stakeholder email list, and updates to the GSP website. There is no specific outreach described for members of the DAC communities or domestic well owners.

NGO-016

- The Stakeholder Communication and Engagement Plan does not include a plan for continual opportunities for engagement through the *implementation* phase of the GSP for DACs, domestic well owners, and environmental stakeholders.

NGO-017

**RECOMMENDATION**

- In the Stakeholder Communication and Engagement Plan, describe active and targeted outreach to engage DAC members, domestic well owners, and environmental stakeholders throughout 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.

NGO-016 cont.

[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)]

## 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[5] and establishing minimum thresholds.[6,7]

**Disadvantaged Communities and Drinking Water Users**

For chronic lowering of groundwater levels, the GSP does not sufficiently describe or analyze direct or indirect impacts on domestic drinking water wells, DACs, or tribes when defining undesirable results. The GSP does not sufficiently describe how the existing minimum threshold groundwater levels are consistent with avoiding undesirable results in the basin. NGO-018 NGO-019

For degraded water quality, minimum thresholds for two constituents of concern (COCs), nitrate and specific conductivity, are set at the maximum contaminant levels (MCLs). However, the GSP does not set SMC for the other COCs in the basin (benzene, arsenic, boron, iron, manganese, and pH). The GSP states on p. 3-49 that because benzene is already being monitored and managed by the Regional Board through the Leaking Underground Storage Tank (LUST) program, SMC are not needed. The GSP states that since arsenic, boron, iron, manganese, and pH are naturally occurring, SMC are not needed. However, SMC should be established for all COCs in the basin, in addition to coordinating with water quality regulatory programs. Naturally occurring COCs can be exacerbated as a result of groundwater use or groundwater management within the basin. NGO-020

To determine undesirable results for water quality, the GSP performs a statistical analysis that describes the undesirable result as follows (p. 3-50): "This quantitative measure assures that water quality remains constant and does not increase by more than 15% per year, on average over ten years, in more than 25% of wells in the monitoring network. It also assures that water quality does not exceed maximum thresholds for concentration, MT, in more than 25% of wells in the monitoring network." The GSP does not, however, discuss impacts on drinking water users, DACs, or tribes when defining this undesirable result, such as describing how many domestic wells would be impacted by degraded water quality. NGO-021

**RECOMMENDATIONS**

**Chronic Lowering of Groundwater Levels**

- Describe direct and indirect impacts on DACs, drinking water users, and tribes when describing undesirable results for chronic lowering of groundwater levels. NGO-018 cont.
- Consider and evaluate the impacts of selected minimum thresholds and measurable objectives on DACs, drinking water users, and tribes within the basin. Further describe NGO-019 cont.

[5] "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)]

[6] "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)]

[7] "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)]

the impact of passing the minimum threshold for these users. For example, provide the number of domestic wells that would be de-watered at the minimum threshold.

NGO-019 cont.

**Degraded Water Quality**

- Describe direct and indirect impacts on DACs, drinking water users, 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."[8]

NGO-021 cont.

- Evaluate the cumulative or indirect impacts of proposed minimum thresholds for degraded water quality on DACs, drinking water users, and tribes.
- Set minimum thresholds and measurable objectives for water quality constituents within the basin including naturally occurring constituents that can be exacerbated as a result of groundwater use or groundwater management. Ensure they align with drinking water standards[9].

NGO-020 cont.

**Groundwater Dependent Ecosystems and Interconnected Surface Waters**

The GSP states (p. 3-44): "Though SMCs for GDEs are not required by SGMA, the minimum thresholds for SV02 will be set to protect beneficial users such as GDEs and set at the Fall minimum." The GSP further states (p. 3-45): "Based on the 7 year history of data recorded in the CASGEM system for SV02, the MT for SV02 will be set at 31 feet below ground surface for the Fall measurement." The seven year period for which data is available is not provided in the GSP. Furthermore, the GSP does not discuss or analyze the potential impacts to GDEs based on the proposed minimum threshold. If minimum thresholds are set to historic low groundwater levels (or lower) and the basin is allowed to operate at or close to those levels over many years, there is a risk of causing catastrophic damage to ecosystems that are more adverse than what was occurring at the height of the 2012-2016 drought. This is because California ecosystems, which are adapted to our Mediterranean climate, have some drought strategies that they can utilize to deal with short-term water stress. However, if the drought conditions are prolonged, the ecosystem can collapse.

NGO-022

NGO-023

The minimum threshold for depletion of ISW is set to 100 cubic feet per second (cfs). The GSP states (p 3-45): "Based on the limited 5-year history of measurements for the groundwater contributions SMC, a preliminary Minimum Threshold will be set at 100 CFS of average monthly groundwater contributions." Based on discussion in the GSP, it is not clear how this value is derived and how it relates to beneficial users. 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 basin, such as increased mortality and inability to perform key life processes (e.g., reproduction, migration).

NGO-024

NGO-025

[8] 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.

[9] "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)]

**RECOMMENDATIONS**

- 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[10] in the basin. Defining undesirable results is the crucial first step before the minimum thresholds[11] can be determined.

- When defining undesirable results for depletion of interconnected surface water, include a description of potential impacts on instream habitats within ISWs when defining minimum thresholds in the basin[12]. 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[6,13].

NGO-023 cont.

NGO-025 cont.

## 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[14] 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.

The integration of climate change into the projected water budget is **incomplete**. The GSP does incorporate climate change into the projected water budget using DWR change factors for 2030 and 2070. The GSP also considers multiple climate scenarios (e.g., the 2070 moderately wet and extremely dry climate scenarios) in the projected water budget. The GSP includes climate change into key inputs (e.g., precipitation, evaporation, and surface water flow) of the projected water budget.

However, the GSP does not calculate a sustainable yield based on the projected water budget with climate change incorporated, but instead states that the sustainable yield will vary over time as new

NGO-026

[10] "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)]

[11] 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)]

[12] "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)]

[13] 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

[14] "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)]

project and management actions are added. The GSP states (p. 2-151): "The sustainable yield is not a number that is constant over time, as future conditions may decrease or increase the amount of groundwater that can be withdrawn without causing undesirable results." Furthermore, the GSP states: "For every implementation of a PMA resulting in the reduction in groundwater pumping, including some conservation easements, there is a commensurate downward adjustment in sustainable yield. The exact amount of that adjustment varies over time and will depend on the future portfolio of PMAs implemented (see chapters 3 and 4). Without the automatic adjustment of the sustainable yield to future agreed-upon reductions in groundwater pumping, other water users in the Basin may claim that the reduction in groundwater pumping, e.g., for in lieu recharge, makes groundwater available for pumping elsewhere or at other times, up to the (constant) limit of the sustainable yield. This must be avoided to successfully manage the basin." Keep in mind that sustainable yield is a legally required component of SGMA and necessary for informing what project and management actions are necessary in the basin. If sustainable yield is not calculated, then there is also increased uncertainty in virtually every subsequent calculation used to plan for projects, derive measurable objectives, and set minimum thresholds. Plans that do not explicitly calculate sustainable yield may underestimate future impacts on vulnerable beneficial users of groundwater such as ecosystems, DACs, domestic well owners, and tribes.

NGO-026 cont.

NGO-026 cont.

**RECOMMENDATIONS**

- Estimate sustainable yield based on the projected water budget with climate change incorporated, to inform the basis for development of projects and management actions.
- Incorporate climate change scenarios into projects and management actions.

NGO-027

## 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 Points (RMPs) in the monitoring network that represent water quality conditions and shallow groundwater elevations around DACs, domestic wells, GDEs, and ISWs. 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[15].

NGO-028

The GSP includes a data gap assessment (Appendix 3-A) that identifies and prioritizes data gaps in the monitoring networks. Thus while the GSP recognizes the importance of filling data gaps, it does not provide specific plans, well locations shown on a map, or a timeline to fill the data gaps. The GSP states (p. 3-7): "These additional monitoring or information requirements depend on future availability of funding and are not yet considered among the GSP Representative Monitoring Points (RMPs). They will be considered as potential RMPs and may eventually become part of the GSP network at the 5-year GSP update." However, the additional RMPs should be included in the GSP now, instead of included in the 5-year GSP update. Without a map of proposed new monitoring well locations, a determination cannot be made regarding the adequacy of the monitoring network for sustainability indicators going forward into the GSP implementation phase.

NGO-028 cont.

NGO-028 cont.

[15] "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, GDEs, and ISWs to clearly identify potentially impacted areas. Increase the number of representative monitoring points (RMPs) across the basin as needed to adequately monitor all groundwater condition indicators. Prioritize proximity to GDEs and drinking water users when identifying new RMPs. NGO-029 NGO-030
- Provide specific plans to fill data gaps in the monitoring network. Evaluate how the gathered data will be used to identify and map GDEs and ISWs, and identify DACs and shallow domestic well users that are vulnerable to undesirable results. NGO-031
- Further describe the biological monitoring that will be used to assess the potential for significant and unreasonable impacts to GDEs or ISWs due to groundwater conditions in the basin. Appendix 3-A mentions the use of satellite images to evaluate the health of GDEs over time, however no further details are provided in the GSP. NGO-032

## 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 benefits or impacts of identified projects and management actions to beneficial users of groundwater such as DACs and drinking water users. NGO-033

We commend the GSA for including several projects and management actions with explicit benefits to the environment. The GSP discusses how these projects will benefit ecosystems, but does not discuss the manner in which DACs, drinking water users, and tribes may be benefitted or impacted by projects and management actions identified in the GSP. Therefore, potential project and management actions may not protect these beneficial users. Groundwater sustainability under SGMA is defined not just by sustainable yield, but by the avoidance of undesirable results for *all* beneficial users. NGO-033 cont.

**RECOMMENDATIONS**

- For DACs and domestic well owners, include a drinking water well impact mitigation program to proactively monitor and protect drinking water wells through GSP implementation. Refer to Attachment B for specific recommendations on how to implement a drinking water well mitigation program. NGO-034
- For DACs, domestic well owners, and tribes, 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. NGO-033 cont.
- Recharge ponds, reservoirs, and facilities for managed stormwater recharge can be designed as multiple-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. For guidance on how to NGO-035

integrate multi-benefit recharge projects into your GSP, refer to the “Multi-Benefit Recharge Project Methodology Guidance Document”[16].

- Develop management actions that incorporate climate and water delivery uncertainties to address future water demand and prevent future undesirable results.

NGO-035 cont.

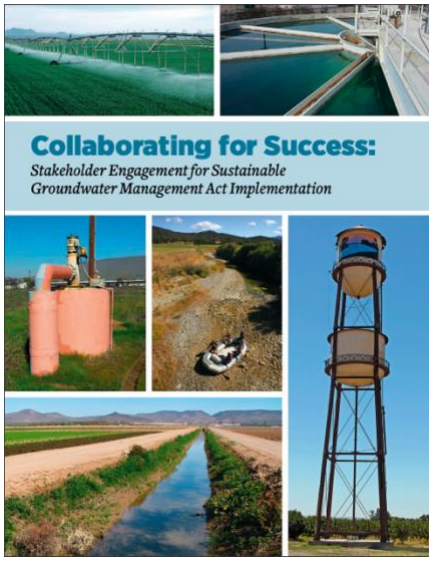
NGO-036

[16] 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

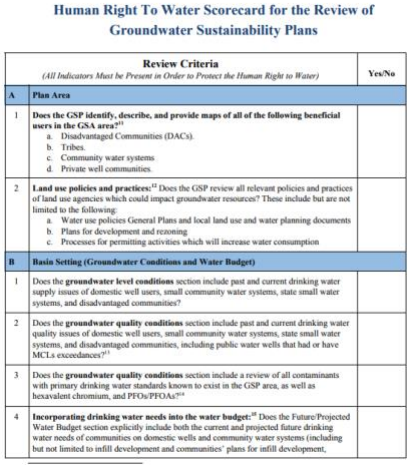
## Stakeholder Engagement and Outreach




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



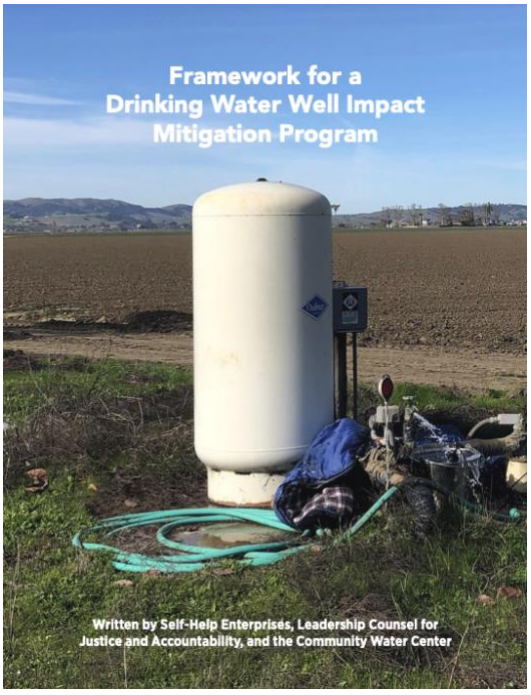
**Human Right To Water Scorecard for the Review of Groundwater Sustainability Plans**

| | Review Criteria *(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.

---

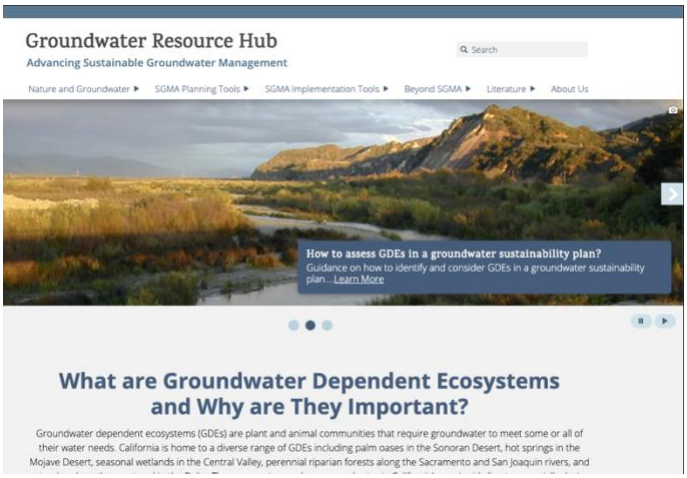
## Drinking Water Well Impact Mitigation Framework




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.

---

## 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.

---

## 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

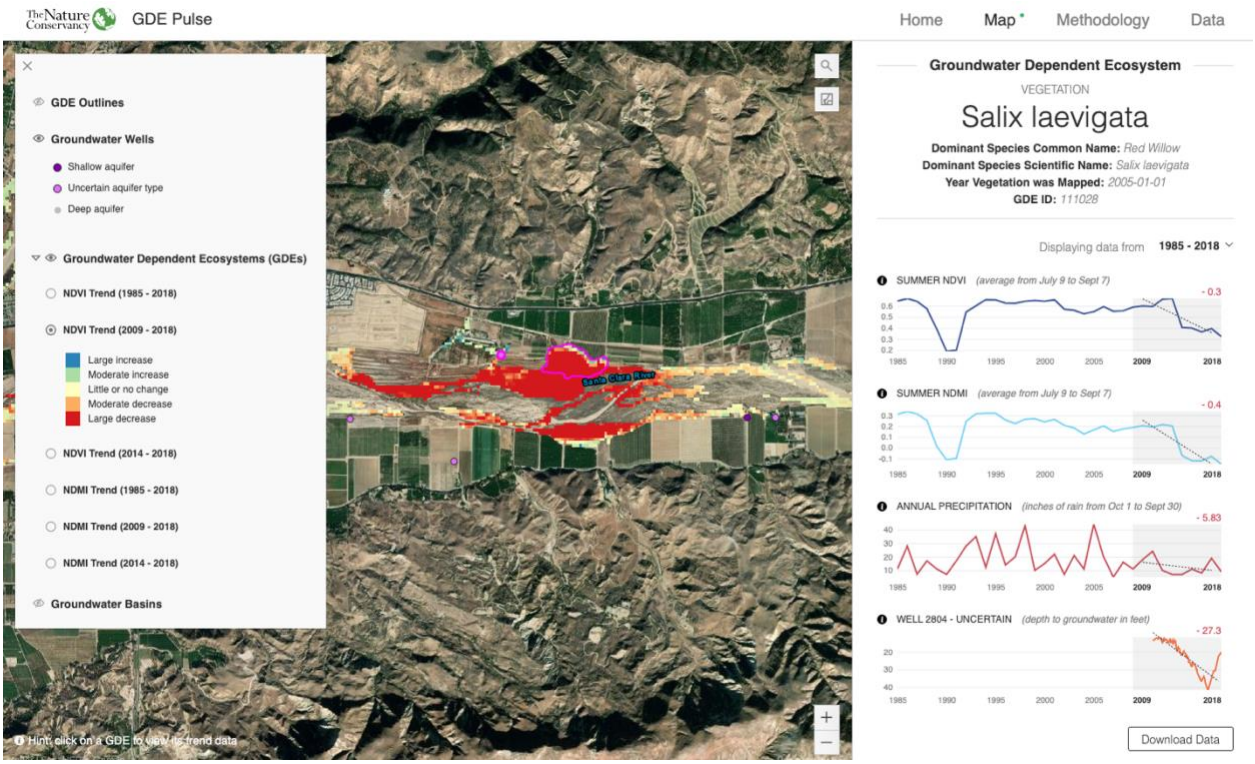
## How the database was compiled

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.

---

[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.

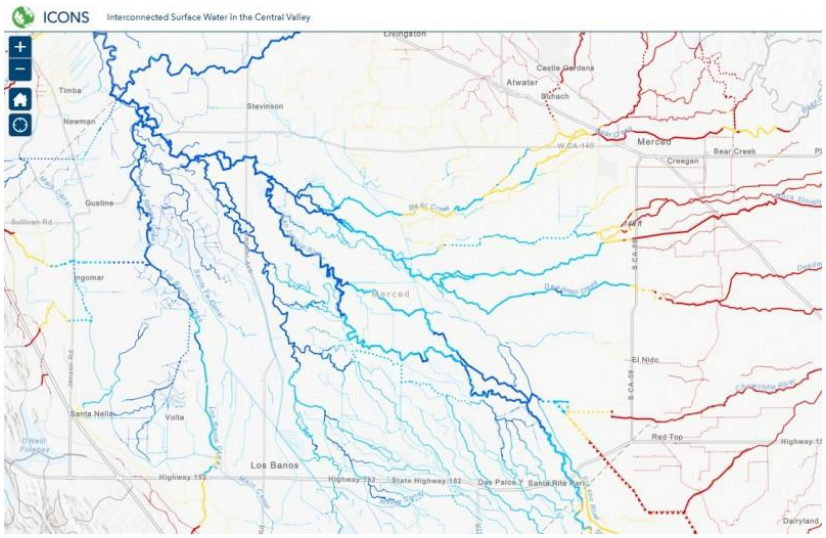
**Annual Precipitation** is the total precipitation for the water year (October 1st – September 30th) from the PRISM dataset. The amount of local precipitation can affect vegetation with more precipitation generally leading to higher NDVI and NDMI.

**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.

---

# 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 Shasta Valley

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 Shasta Valley Basin. To produce the freshwater species list, we used ArcGIS to select features within the California Freshwater Species Database version 2.0.9 within the basin boundary. This database contains information on ~4,000 vertebrates, macroinvertebrates and vascular plants that depend on fresh water for at least one stage of their life cycle. The methods used to compile the California Freshwater Species Database can be found in Howard et al. 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** | | | | |
| Grus canadensis tabida | Greater Sandhill Crane | | Threatened | |
| Actitis macularius | Spotted Sandpiper | | | |
| Aechmophorus occidentalis | Western Grebe | | | |
| Agelaius tricolor | Tricolored Blackbird | Bird of Conservation Concern | Special Concern | BSSC - First priority |
| Agelaius tricolor | Tricolored Blackbird | Bird of Conservation Concern | Special Concern | BSSC - First priority |
| Aix sponsa | Wood Duck | | | |
| Aix sponsa | Wood Duck | | | |
| Anas acuta | Northern Pintail | | | |
| Anas americana | American Wigeon | | | |
| Anas americana | American Wigeon | | | |
| Anas americana | American Wigeon | | | |
| Anas clypeata | Northern Shoveler | | | |
| Anas clypeata | Northern Shoveler | | | |
| Anas crecca | Green-winged Teal | | | |
| Anas cyanoptera | Cinnamon Teal | | | |
| Anas platyrhynchos | Mallard | | | |
| Anas platyrhynchos | Mallard | | | |
| Anas strepera | Gadwall | | | |

[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

| | | | | |
|---|---|---|---|---|
| Anas strepera | Gadwall | | | |
| Anser albifrons | Greater White-fronted Goose | | | |
| Ardea alba | Great Egret | | | |
| Ardea herodias | Great Blue Heron | | | |
| Ardea herodias | Great Blue Heron | | | |
| Aythya affinis | Lesser Scaup | | | |
| Aythya affinis | Lesser Scaup | | | |
| Aythya collaris | Ring-necked Duck | | | |
| Aythya valisineria | Canvasback | | Special | |
| Botaurus lentiginosus | American Bittern | | | |
| Bucephala albeola | Bufflehead | | | |
| Bucephala albeola | Bufflehead | | | |
| Bucephala albeola | Bufflehead | | | |
| Bucephala albeola | Bufflehead | | | |
| Butorides virescens | Green Heron | | | |
| Calidris mauri | Western Sandpiper | | | |
| Calidris minutilla | Least Sandpiper | | | |
| Cinclus mexicanus | American Dipper | | | |
| Cinclus mexicanus | American Dipper | | | |
| Cinclus mexicanus | American Dipper | | | |
| Cistothorus palustris palustris | Marsh Wren | | | |
| Cygnus columbianus | Tundra Swan | | | |
| Fulica americana | American Coot | | | |
| Fulica americana | American Coot | | | |
| Fulica americana | American Coot | | | |
| Gallinago delicata | Wilson's Snipe | | | |
| Gallinago delicata | Wilson's Snipe | | | |
| Gallinago delicata | Wilson's Snipe | | | |
| Grus canadensis | Sandhill Crane | | | |
| Grus canadensis | Sandhill Crane | | | |
| Grus canadensis | Sandhill Crane | | | |
| Haliaeetus leucocephalus | Bald Eagle | Bird of Conservation Concern | Endangered | |
| Haliaeetus leucocephalus | Bald Eagle | Bird of Conservation Concern | Endangered | |
| Icteria virens | Yellow-breasted Chat | | Special Concern | BSSC - Third priority |
| Limnodromus scolopaceus | Long-billed Dowitcher | | | |

| | | | | |
|---|---|---|---|---|
| Megaceryle alcyon | Belted Kingfisher | | | |
| Mergus merganser | Common Merganser | | | |
| Mergus merganser | Common Merganser | | | |
| Oxyura jamaicensis | Ruddy Duck | | | |
| Oxyura jamaicensis | Ruddy Duck | | | |
| Oxyura jamaicensis | Ruddy Duck | | | |
| Pelecanus erythrorhynchos | American White Pelican | | Special Concern | BSSC - First priority |
| Phalacrocorax auritus | Double-crested Cormorant | | | |
| Phalaropus tricolor | Wilson's Phalarope | | | |
| Podilymbus podiceps | Pied-billed Grebe | | | |
| Porzana carolina | Sora | | | |
| Rallus limicola | Virginia Rail | | | |
| Riparia riparia | Bank Swallow | | Threatened | |
| Setophaga petechia | Yellow Warbler | | | BSSC - Second priority |
| Tachycineta bicolor | Tree Swallow | | | |
| Tachycineta bicolor | Tree Swallow | | | |
| Tringa melanoleuca | Greater Yellowlegs | | | |
| Xanthocephalus xanthocephalus | Yellow-headed Blackbird | | Special Concern | BSSC - Third priority |
| Xanthocephalus xanthocephalus | Yellow-headed Blackbird | | Special Concern | BSSC - Third priority |
| **HERPS** | | | | |
| Actinemys marmorata marmorata | Western Pond Turtle | | Special Concern | ARSSC |
| Actinemys marmorata marmorata | Western Pond Turtle | | Special Concern | ARSSC |
| Anaxyrus boreas boreas | Boreal Toad | | | |
| Anaxyrus boreas boreas | Boreal Toad | | | |
| Ascaphus truei | Coastal Tailed Frog | | | |
| Ascaphus truei | Coastal Tailed Frog | | | |
| Dicamptodon tenebrosus | Pacific Giant Salamander | | | |
| Dicamptodon tenebrosus | Pacific Giant Salamander | | | |

| | | | | |
|---|---|---|---|---|
| Pseudacris regilla | Northern Pacific Chorus Frog | | | |
| Rana boylii | Foothill Yellow-legged Frog | Under Review in the Candidate or Petition Process | Special Concern | ARSSC |
| Rana boylii | Foothill Yellow-legged Frog | Under Review in the Candidate or Petition Process | Special Concern | ARSSC |
| Rana cascadae | Cascades Frog | Under Review in the Candidate or Petition Process | Special Concern | ARSSC |
| Rana cascadae | Cascades Frog | Under Review in the Candidate or Petition Process | Special Concern | ARSSC |
| Taricha granulosa | Rough-skinned Newt | | | |
| Taricha granulosa | Rough-skinned Newt | | | |
| Thamnophis sirtalis sirtalis | Common Gartersnake | | | |
| Thamnophis sirtalis sirtalis | Common Gartersnake | | | |
| Actinemys marmorata marmorata | Western Pond Turtle | | Special Concern | ARSSC |
| Actinemys marmorata marmorata | Western Pond Turtle | | Special Concern | ARSSC |
| Actinemys marmorata marmorata | Western Pond Turtle | | Special Concern | ARSSC |
| **INSECTS & OTHER INVERTS** | | | | |
| Agabus lutosus | | | | Not on any status lists |
| Anax junius | Common Green Darner | | | |
| Dytiscus marginicollis | | | | Not on any status lists |
| Lestes congener | Spotted Spreadwing | | | |
| Libellula forensis | Eight-spotted Skimmer | | | |
| Libellula nodisticta | Hoary Skimmer | | | |
| Libellula pulchella | Twelve-spotted Skimmer | | | |
| Libellula saturata | Flame Skimmer | | | |
| Plathemis lydia | Common Whitetail | | | |
| Sympetrum madidum | Red-veined Meadowhawk | | | |
| Sympetrum pallipes | Striped Meadowhawk | | | |
| Tanypteryx hageni | Black Petaltail | | | |
| **MAMMALS** | | | | |

| | | | | |
|---|---|---|---|---|
| Castor canadensis | American Beaver | | | Not on any status lists |
| 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 |
| Neovison vison | American Mink | | | Not on any status lists |
| Ondatra zibethicus | Common Muskrat | | | Not on any status lists |
| Ondatra zibethicus | Common Muskrat | | | Not on any status lists |
| Sorex palustris | American Water Shrew | | | Not on any status lists |
| **MOLLUSKS** | | | | |
| Gonidea angulata | Western Ridged Mussel | | Special | |
| Margaritifera falcata | Western Pearlshell | | Special | |
| Gonidea angulata | Western Ridged Mussel | | Special | |
| Margaritifera falcata | Western Pearlshell | | Special | |
| **PLANTS** | | | | |
| Bidens cernua | Nodding Beggarticks | | | |
| Carex lasiocarpa | Slender Sedge | | Special | CRPR - 2B.3 |
| Euthamia occidentalis | Western Fragrant Goldenrod | | | |
| Scirpus pendulus | Pendulous Bulrush | | Special | CRPR - 2B.2 |

# Attachment D

The Nature Conservancy

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.

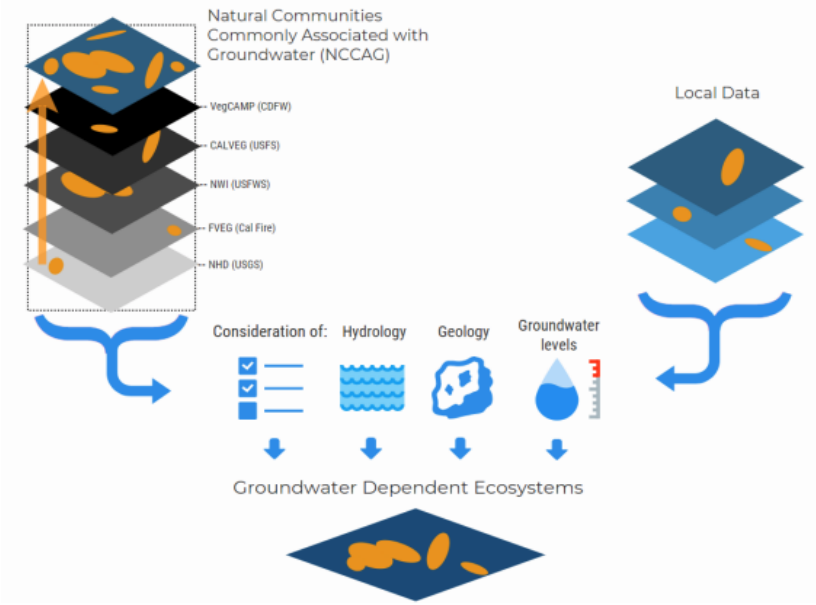



**Figure 1. Considerations for GDE identification.**
Source: DWR[2]

[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

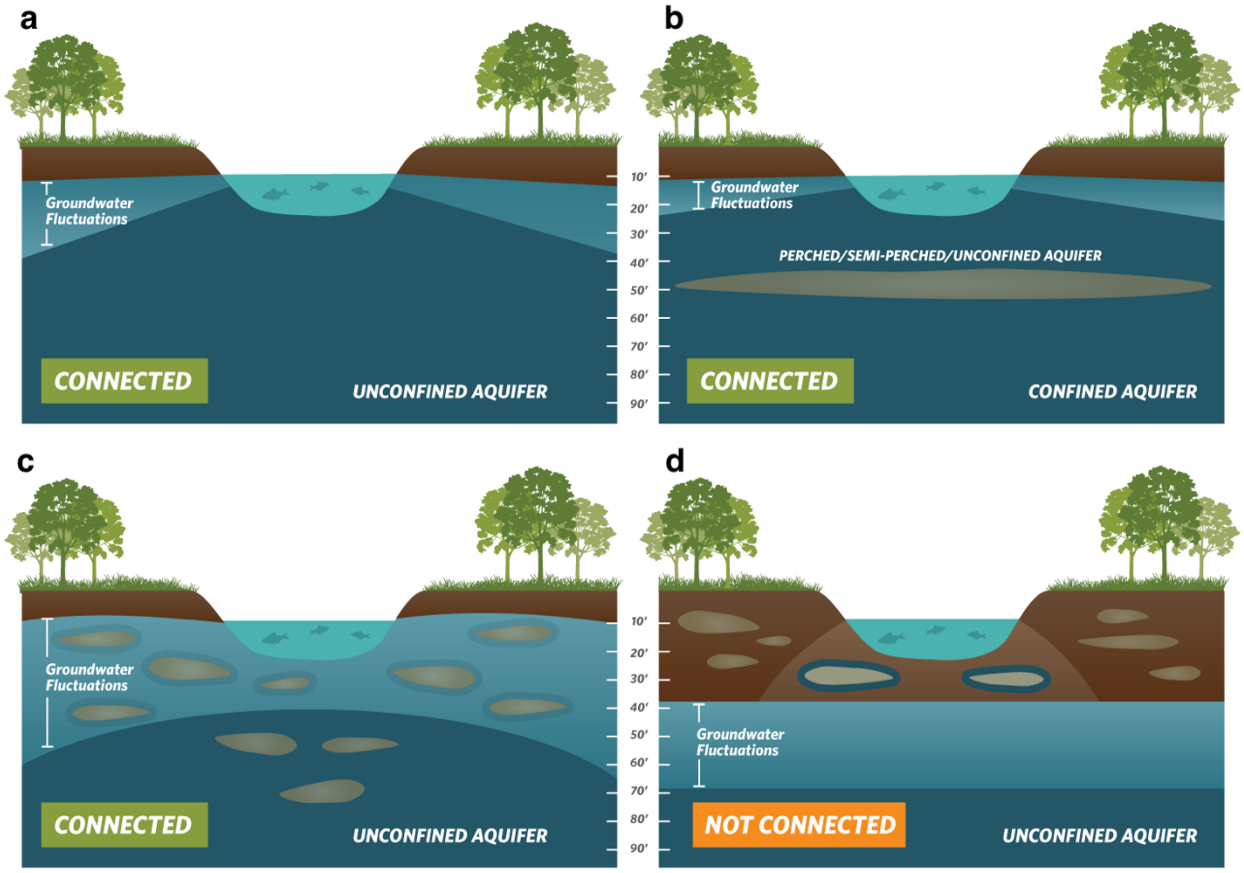



**Figure 2. Confirming whether an ecosystem is connected to groundwater. Top: (a)** Under the ecosystem is an unconfined aquifer with depth-to-groundwater fluctuating seasonally and interannually within 30 feet from land surface. **(b)** Depth-to-groundwater in the shallow aquifer is connected to overlying 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).

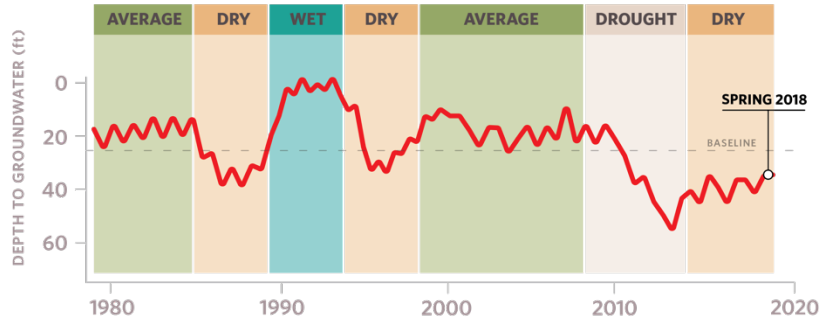



**Figure 3. Example seasonality and interannual variability in depth-to-groundwater over time.** Selecting one point in time, such as Spring 2018, to characterize groundwater conditions in GDEs fails to capture what groundwater conditions are necessary to maintain the ecosystem status into the future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

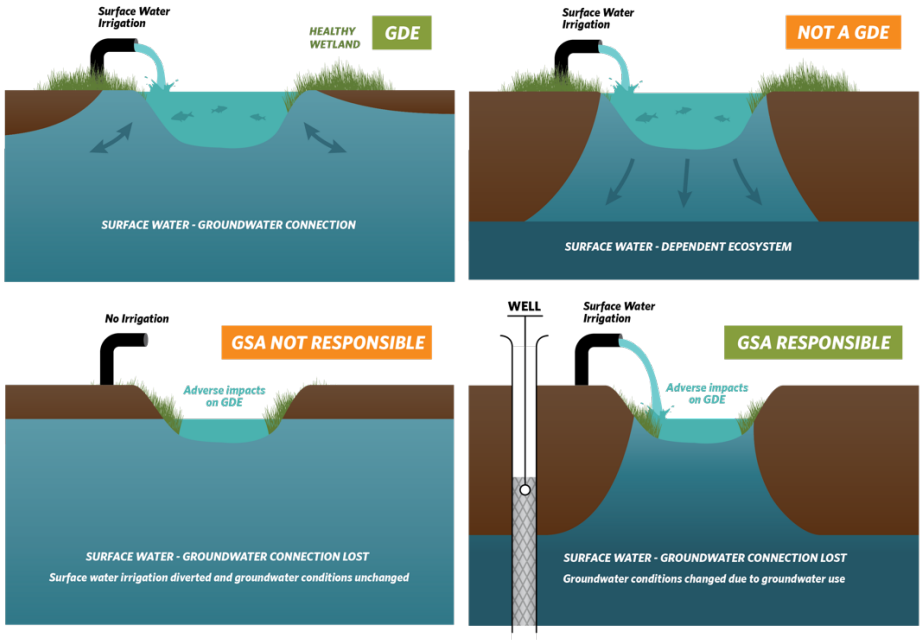



**Figure 4. Ecosystems often depend on multiple sources of water. Top: (Left)** Surface water and groundwater are interconnected, meaning that the GDE is supported by both groundwater and surface water. **(Right)** Ecosystems that are only reliant on non-groundwater sources are not groundwater-dependent. **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.

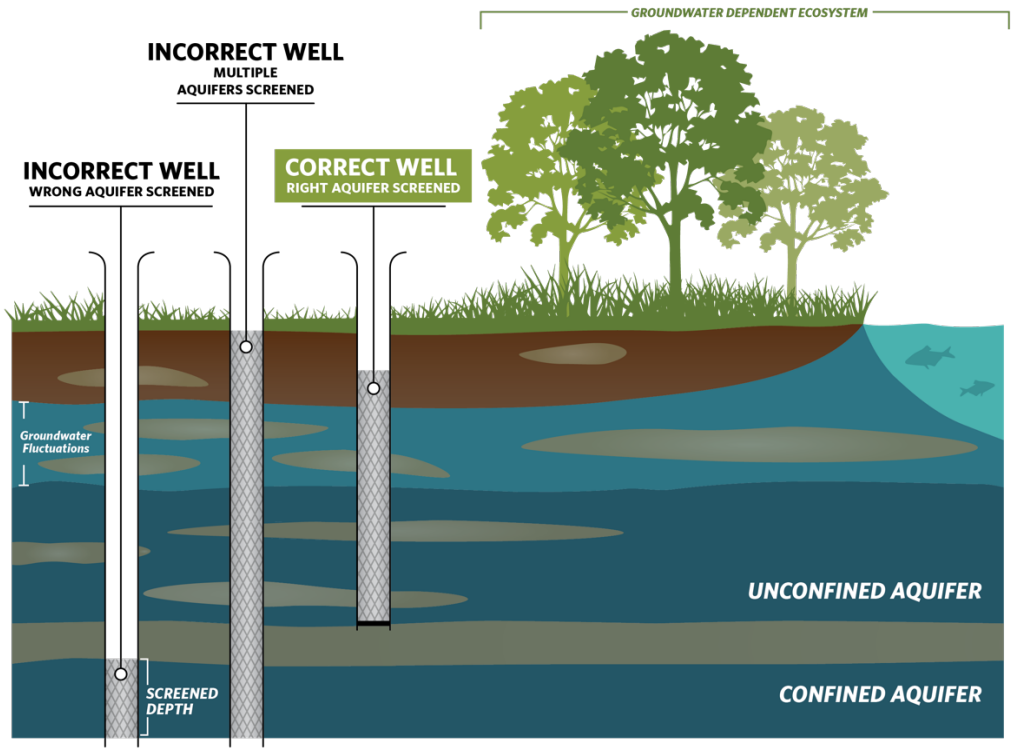



**Figure 5. Selecting representative wells to characterize groundwater conditions near GDEs.**

## 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.

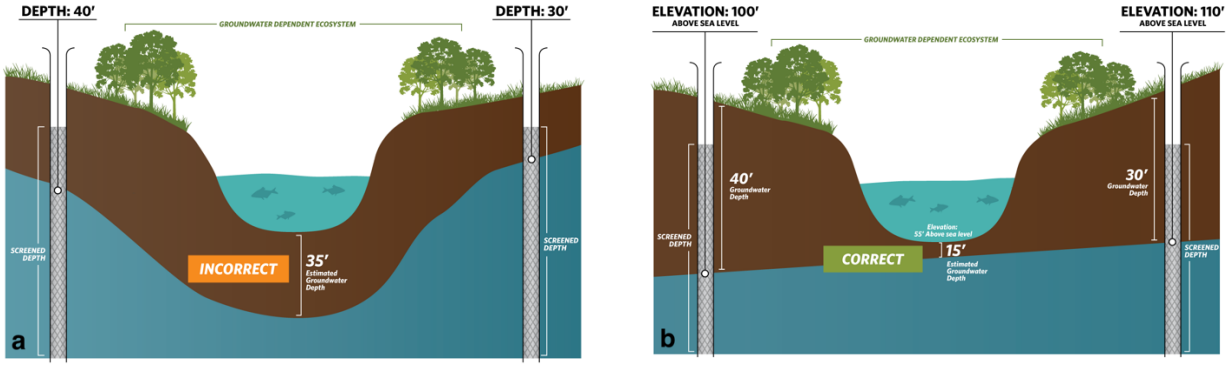



**Figure 6. Contouring depth-to-groundwater around surface water features and GDEs. (a)** Groundwater level interpolation using depth-to-groundwater data from monitoring wells. **(b)** Groundwater level interpolation using groundwater elevation data from monitoring wells and DEM data.

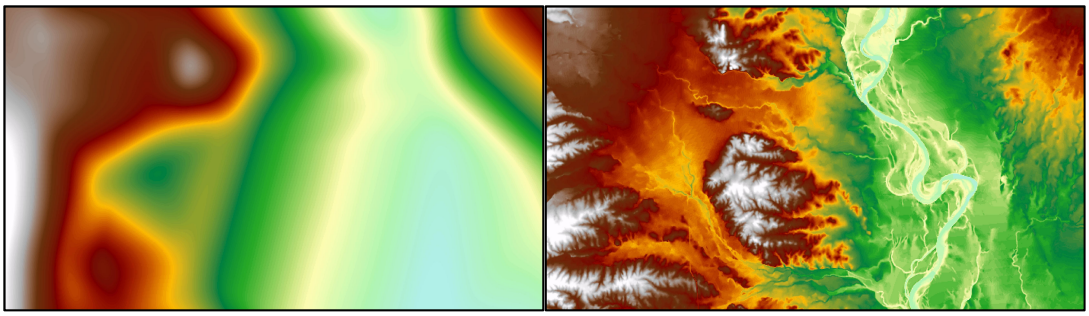


**Figure 7. Depth-to-groundwater contours in Northern California. (Left)** Contours were interpolated using depth-to-groundwater measurements determined at each well. **(Right)** Contours were determined by interpolating groundwater elevation measurements at each well and superimposing ground surface 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.

Karuk Community Health Clinic
64236 Second Avenue
Post Office Box 316
Happy Camp, CA 96039
Phone: (530) 493-5257
Fax: (530) 493-5270

Karuk Tribe

Karuk Dental Clinic
64236 Second Avenue
Post Office Box 1016
Happy Camp, CA 96039
Phone: (530) 493-2201
Fax: (530) 493-5364

Administrative Office
Phone: (530) 493-1600 • Fax: (530) 493-5322
64236 Second Avenue • Post Office Box 1016 • Happy Camp, CA 96039

September 23, 2021

Ray Haupt, Chair
Siskiyou County Flood Control & Water Conservation District
P.O. Box 750
1312 Fairlane Road
Yreka Ca 96097

**Re: Karuk Tribe Comments on Scott and Shasta Groundwater Sustainability Plans**

Ayukîi Chairman Haupt:

The careful and sustainable management of our groundwater is critically important to ensuring Siskiyou County residents have ample water supplies to meet future drinking, agricultural, and environmental needs. For the Tribe, proper management of groundwater is a critical part of ensuring that the in-stream flow needs of fisheries are met today and into the future.

The Sustainable Groundwater Management Act (SGMA) was enacted to protect and sustainably manage California's groundwater resources. The Karuk Tribe continues to be disappointed and frustrated by the Siskiyou County's implementation of SGMA. Since 2017, requests to form a Groundwater Sustainability Agency that includes tribes have been ignored. Despite efforts to craft a Memorandum of Understanding to facilitate good faith communication and exchange of information, the County has largely ignored the Tribe's requests for government-to-government meetings and our input into the SGMA process.

This most recent comment period on the draft Groundwater Sustainability Plans for the Scott and Shasta are another example of the County's refusal to act in good faith with the Karuk Tribe or other entities. The County did not share all of the technical materials that support the documents to be reviewed in a timely manner. This resulted in Tribes, agencies, and others scrambling to perform a technical review on hundreds of pages of materials, draft comments, and get comments approved by governing councils or management in two weeks.

This process has been deeply flawed and mismanaged from the outset and does a disservice to the Tribes, non-tribal constituents, agricultural operators, fishermen, and others seeking certainty and resolution of the water resource conflicts in our region. In fact, because of the deep flaws in the process and the work product, its likely to create more uncertainty for everyone.

## Comments on the Scott Groundwater Sustainability Plan

### 1. The GSP Fails to Properly Specify Undesirable Results, Minimum Thresholds and Measurable Objectives for the Interconnected Surface Waters Sustainability Goal

Despite the known impacts of low flows on protected species, the GSP fails to properly define undesirable results, minimum thresholds, and measurable objectives for the interconnected surface waters (ISW) sustainability indicator.

SGMA sets out a three-step process for defining these terms. The undesirable result is an "effect" caused by over pumping; here, the depletion of streamflow. (Wat. Code § 10721, def (x)(6); Cal. Code Regs. tit. 23, § 354.26.) The minimum threshold is the numeric value that determines when an effect becomes "undesirable," i.e. when it becomes "significant and unreasonable." (Wat. Code § 10721, def. (x); Cal. Code Regs. tit. 23, § 354. It must

> quantify groundwater conditions for each applicable sustainability indicator at each monitoring site or representative monitoring site established pursuant to Section 354.36. The numeric value used to define minimum thresholds shall represent a point in the basin that, if exceeded, may cause undesirable results....

(Cal. Code Regs., tit. 23, § 354.28, subd. (a).) With regard to depletions of interconnected surface water, the regulations require that the minimum threshold be defined as 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." (*Id.* § 354.28, subd. (c)(6).) And the measurable objective represents numeric targets to achieve sustainability; that is, to avoid undesirable results by keeping the basin above the minimum threshold. (Cal. Code Regs. tit. 23, § 354.30.)

The GSP defines these terms for interconnected surface waters in a way that fails, as the statute requires, to tie the results of over pumping to concrete effects in the basin. The GSP distinguishes between a "SGMA undesirable result" and an "aspirational 'watershed goal.'" (GSP at 3.57-59.) The former is defined as "stream depletion that can be attributed to groundwater pumping outside of the adjudicated zone to the degree it leads to significant and unreasonable impacts on beneficial uses of surface water." (GSP at 3.57.) The minimum threshold is defined as the "the amount of stream depletion reversal achieved by one or an equivalent set of multiple minimum required PMAs to meet the intent of SGMA (no additional undesirable results), and Porter Cologne and the PTD (some reversal of existing undesirable results)."[1] (GSP at 3.60.) And the measurable objectives are defined by percentages of streamflow depletion reversed by PMAs. (GSP at 3.63-64.)

**2. The Undesirable Result Definition is Tautological and Fails to Achieve Basin-Wide Sustainability as SGMA Requires**

As part of achieving a basin's "sustainability goal," a GSP must "identify" "undesirable result[s]." (Wat. Code §§ 10721 subds. (u)-(x); 10727.2, subd. (b).) An "undesirable result" means an "effect[] caused by groundwater conditions throughout the basin." (Id. § 10721, subd. (x).) Undesirable results include "[d]epletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water." (Id. § 10721, subd. (x)(6).)

The GSP must define these "significant" and "unreasonable" effects. (Cal. Code Regs. tit. 23, § 354.26(a).) But the GSP's definition of "undesirable results" is a tautology. The GSP defines it as "significant and unreasonable stream depletion due to groundwater extraction from wells subject to SGMA (i.e., outside of the Adjudicated Zone)." (GSP at 3.59.) By including the terms "significant and unreasonable" in the definition, the GSP fails to provide a workable definition: an effect is defined as unreasonable if it is unreasonable. This is nonsensical and unworkable. In *Asociacion de Gente Unida por*

[1] The GSP finds that the ISW undesirable result existed prior to 2015 and thus the GSP need not address it under SGMA. (GSP at 3.55-56; Wat. Code § 10727.2.) This memo discusses this finding below.

*el Agua v. Central Valley Regional Water Quality Control Board* (2012) 210 Cal.App.4th 1255, 1280, the Court of Appeal disapproved a waste discharge requirement for dairy pollution where "the basis for concluding that any degradation of groundwater will be of maximum benefit to the people of California is that the Order states that it prohibits any further degradation of groundwater." The court found that this reasoning was "circular." (*Ibid.*) The same is true here.

What the GSP could have done, but did not do, is establish a streamflow target that is protective of beneficial uses in the Scott. It then could have determined the relative contributions of groundwater users inside and outside the adjudication along with surface users. It could then establish the needed reductions in use by all three categories of water users. Even though the GSA lacks authority over surface users and the adjudicated zone, the exercise would inform the amount that pumpers outside the zone need to reduce by to reach a satisfactory flow rate. And making these calculations would inform the County, the State Board, the Watermaster, and potentially the courts and other agencies about the scale and nature of needed actions. This approach would also comply with SGMA by quantifying the undesirable result and minimum threshold.

Starting with a streamflow target and working backwards is consistent with SGMA because the statute measures compliance at the basin scale. For instance, the "sustainability goal" means ensuring that the "applicable basin is operated within its sustainable yield." (Wat. Code § 10721, def. (u).) And an "undesirable result" means "one or more of the following effects caused by groundwater conditions occurring throughout the basin." (*Id.* def. (x).) And DWR evaluates GSPs to determine whether they are "likely to achieve the sustainability goal for the basin covered by the groundwater sustainability plan." (Wat. Code § 10733, subd. (b).) The regulations reiterate that undesirable results are "significant and unreasonable effects…occurring throughout the basin." (Cal. Code Regs. tit. 23, § 354.26(a).) Again, the regulations and the statute include the language "throughout the basin." If the legislature did not want to include consideration of effects in the adjudicated areas, it could have done so but did not. By focusing solely on pumping outside the adjudicated zone, the GSP fails to ensure, or even analyze what would be necessary to ensure that the basin as a whole reaches sustainability.

**3. The Undesirable Result Is Not Quantified, in Violation of the SGMA Regulations**

The SGMA regulations require the GSP to quantify the undesirable result:

> The criteria used to define when and where the effects of the groundwater conditions cause undesirable results for each applicable sustainability indicator. The criteria shall be based on a **quantitative description** of the combination of minimum threshold exceedances that cause significant and unreasonable effects in the basin.

(Cal. Code Regs., tit. 23, § 354.26, subd. (b)(2) (emphasis added).) The description in the GSP is inadequate because it is not a "quantitative description." The regulations are clear that the result must be in the form of numbers tying minimum threshold exceedances to the significant and unreasonable effects. The GSP's description is entirely qualitative. In addition, the description lacks "criteria" for "when and where" groundwater conditions cause significant and unreasonable depletions. Again, SGMA and the regulations make crystal clear that the undesirable results analysis must be tied to physical conditions and physical locations, not solely a model output.

This violates the regulations.

**4. The Reasonableness Analysis Fails to Consider Costs to Beneficial Users of Surface Waters**

The GSP is required to determine whether the depletions of surface waters have "unreasonable impacts on beneficial users of surface waters." But instead of focusing its discussion on the harms to beneficial users, it focuses solely on the costs to groundwater users. This violates SGMA.

The GSP fails to properly consider the "unreasonableness" of stream depletions by failing to analyze not only of the costs of compliance but of the costs to the public, tribes, and commercial fisheries of the loss of fish populations—loss which may include the incalculable consequences of extinction or extirpation. For instance, courts have held that when setting water quality objectives under Water Code section 13241, the "Water Control Boards are charged with taking into account economic considerations, not merely costs of compliance with a permit. As noted, economic considerations also include, among other things, the costs of not addressing the problems of contaminated water." (*City of Duarte v. State Water Resources Control Board* (2021) 60 Cal.App.5th 258, 276.) The same is true here: determining whether an effect is reasonable requires looking at both costs to comply with any restrictions and also the costs to the public of over-extraction.

The GSP states: "In the context of assessing MTs for the ISW SMC, it is reasonable to only hold groundwater producers outside the adjudicated zone to a modest percentage of stream depletion reversal because any greater responsibility would unreasonably constrain groundwater users in the basin." (GSP at 3.58.) Later, the GSP purports to analyze "what is an "unreasonable" amount of stream depletion, which could be reframed as: what is a "reasonable" amount of avoided groundwater use?" (GSP at 3.59.) This is not the question the statute asks: SGMA requires the definition of significant and unreasonable effects to focus on the *results* of stream depletion, not the cost of avoiding it. (Wat. Code § 10721, def. (x); Cal. Code Regs. tit 23, § 354.26(a).) Any costs associated with any constraint on groundwater users has to be balanced against the effect of their actions on groundwater conditions. A reasonableness analysis that focuses entirely on costs to groundwater users is incomplete.

**5. The Unreasonableness Analysis Ignores Legally Binding Streamflow Limits in the Scott River**

The analysis also misses the fact that the State Board recently adopted emergency regulations setting flow levels (embodied in the CDFW drought minimum flows) below which extractions are deemed to be unreasonable. (See Wat. Code § 1058.5. (State Board authority to adopt emergency regulations to "prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water"); Cal. Code Regs. tit. 23, § 875 et seq.) Rather than focusing on the cost of compliance, the GSP must revisit its significant and unreasonable analysis in light of the State Board's determination of what is "reasonable." It is within the State Board's authority to determine which uses are reasonable. (*Stanford Vina Ranch Irrigation Company v. State* (2020) 50 Cal.App.5th 976, 1002–1003 ("[T]he Board is charged with acting to prevent unreasonable and wasteful uses of water, regardless of the claim of right under which the water is diverted.").)

Nor does the fact that extraction has been continuing at these levels for the last several decades (a fraction of the time that the Karuk Tribe has existed in the Klamath basin) make over-extraction of groundwater reasonable. (Wat. Code § 100.5 ("conformity of a use, method of use, or method of diversion of water with local custom shall not be solely determinative of its reasonableness.") The GSP must account for the fact the State Board has now declared flows below the CDFW drought minimum flows to be unreasonable.

**6. Minimum Thresholds Inadequately Defined**

The GSP defines the minimum threshold for interconnected surface waters as "the amount of stream depletion reversal achieved by one or an equivalent set of multiple minimum required PMAs to meet the intent of SGMA (no additional undesirable results), and Porter Cologne and the PTD (some reversal of

existing undesirable results)." (GSP at 3.60.) It goes on specify: "**average stream depletion reversal** of the implemented PMAs during September–November **must exceed 15% of the depletion caused by groundwater pumping from outside the adjudicated zone in 2042 and thereafter**..." (GSP at 3.60 (emphasis in original).) There are at least three problems with this. First, it is circular. Second, the 15% figure is arbitrary and unsupported by evidence. Last, it is not tied to a "monitoring site or representative monitoring site" as required by the regulations.

The minimum threshold is circular because it starts from the premise that the ILR/MAR scenario is all that need be done. The GSP states that Advisory Committee determined it was "reasonable" implement the MAR/ILR scenario of PMAs. (GSP at 3.60.) This involves flooding fields using excess flows in the winter and switching from groundwater to surface water irrigation using excess water in the spring. This scenario does not involve reducing pumping by groundwater users. Having determined the costs associated with the MAR/ILR scenario are reasonable, the GSP simply states that the streamflow associated with that scenario is the minimum threshold. (GSP at 3.61.) This depletion reduction figure is 15%.

By defining the minimum threshold as the results of simulated PMAs, the GSP creates a circle. It can define the undesirable result and achieve it without demonstrating any real-world impact on flows, fish, or the people that rely on them. This violates SGMA.

In addition, the 15% figure is completely lacking in evidence. An agency's action is invalid if it is "arbitrary, capricious, or without evidentiary support." (E.g. *Association of Irritated Residents v. San Joaquin Valley Unified Air Pollution Control Dist.* (2008) 168 Cal.App.4th 535, 542.)

While the GSP implies that it was discussed at the Advisory Committee meetings, there is no justification for why 15% was chosen, and not 50%, 100%, or 5%. Indeed, although the key driver of the GSP's MT analysis is the cost of the MAR/ILR scenario, the GSP *does not consider the cost of the scenario!* (GSP at 3.60-61, 4.27 ("Costs and funding for [the ILR/MAR] project have not yet been explored.") Here, the failure to consider the costs of the ILR/MAR scenario—which is the only basis for the selection of the 15% reduction figure—is arbitrary and capricious because it is not based on any evidence in the record.

Moreover, there is no analysis of the impacts of the 15% depletion reduction on the stream itself. Without this analysis, there is no way to know whether this level of reduction is "significant" or "unreasonable," no matter how the terms are defined. And this illustrates the problem with defining the minimum threshold in terms of a modeled output rather than, as required by the regulations, a value at a monitored site.

The "minimum thresholds" must "quantify groundwater conditions for each applicable sustainability indicator *at each monitoring site or representative monitoring site.*" (Cal. Code Regs., tit. 23, § 354.28(a), emphasis added.) Therefore, the definition of the undesirable result must be "quantitative" and must be tied to minimum threshold exceedances at *particular monitoring sites.*[2] In other words, the SGMA regulations require a GSP to express an undesirable result in terms of a real-world impact to a directly measured value, in this case, streamflow.

The SVIHM model will doubtless be a useful tool and provides invaluable insights into those parameters that cannot be directly measured. But it is not a "monitoring site." The GSP must include minimum thresholds that inform the GSA and the public when physical conditions in the basin have reached the point of being "significant and unreasonable" impacts on interconnected surface waters.

---

[2] Section 352.4 of the regulations makes clear that a monitoring site is a physical location, not a model output. (Cal. Code Regs., tit. 23, § 352.4.)

**7. Measurable Objectives are not Properly Defined**

The GSP attempts to avoid the requirement to define the minimum threshold and measurable objectives in terms of stream flow by referring to section 354.30, subdivision (b) of the regulations. The GSP states, "Choosing the aspirational watershed goal itself as MO would not meet the requirement that quantification/measurement of streamflow depletion that is used to establish the minimum threshold, Section 3.3.5.1, must also [be] used to quantify the MO."[3] But this is precisely backwards. As discussed above, the minimum threshold must be defined with reference to a measured value at a monitoring site. And there is no requirement that the measured value be identical, only that the metrics and monitoring sites be the same. Again, SGMA is clear that measurable objectives, like minimum thresholds and undesirable results, be defined in terms of measurable stream flow, not as a portfolio of PMAs or solely as a model output.

**8. The GSP Does not Consider the 2021 Emergency Regulations or the CDFW Drought Flows**

On June 15. 2021, CDFW transmitted Minimum Flow Recommendations for the Scott and Shasta Rivers to the State Board.[4] The minimum flow recommendation largely tracks the USFS water right at the Fort Jones Gage, with deviations in September (33 cfs), November (60 cfs), and December (150 cfs.)

Based on these recommendations, the 2017 CDFW flow recommendations, and a Petition for Emergency Rulemaking filed by ELF and the Karuk Tribe on July 1, 2021, the State Board adopted emergency regulations setting minimum flows on the Scott and Shasta River in August 2021. (See Cal. Code Regs. Tit. 23, § 875 et seq.)

The emergency regulations establish the CDFW Minimum Flow Recommendations as the minimum permissible flows in the Scott River. (Cal. Code Regs. tit. 23, § 875(c)(1).) State Board staff is authorized to curtail diversions—both surface waters and groundwater—that reduce river flow below those levels. Curtailment orders have now gone out to diverters.

The GSP does not acknowledge either of these events. Rather, it states "However, neither the ESA, TMDL, or PTD specify mandatory targets, minimum thresholds, or specific project requirements." (GSP at 3.57) This statement is not true. The emergency regulation now sets a minimum flow for the Scott River. Thus, the goal of restoring adequate flows in the Scott is no longer "aspirational"—a minimum flow is now the law. The GSP must be revised to account for this.

**9. The GSP Fails to Consider Undesirable Effects that Have Occurred After 2015**

Water Code section 10727.2, subdivision (b)(4) states that a GSP "may, but is not required to, address undesirable results that occurred before, and have not been corrected by, January 1, 2015. Notwithstanding paragraphs (1) to (3), inclusive, a groundwater sustainability agency has discretion as to whether to set measurable objectives and the timeframes for achieving any objectives for undesirable results that occurred before, and have not been corrected by, January 1, 2015."

---

[3] GSP, Chapter 3, at p. 53. The cited regulation states: "measurable objectives shall be established for each sustainability indicator, based on quantitative values using the same metrics and monitoring sites as are used to define the minimum thresholds." (Cal. Code Regs., tit. 23, § 354.30, subd. (b).)

[4] Available at https://www.waterboards.ca.gov/drought/scott_shasta_rivers/docs/swb_2021_shasta_scott_drought_emergency_final.pdf, accessed September 15, 2021.

The GSP says, "In Scott Valley, undesirable results associated with depletion of interconnected surface water that have occurred since January 1, 2015, had already existed for over thirty years prior as of 2015. No additional undesirable results have occurred since January 1, 2015 (Section 2.2.1.6). Additional future surface water depletion due to groundwater pumping will be avoided by rigorous controls set on maintaining current water level conditions (Section 3.4.1) and by avoiding significant additional consumptive water use in Scott Valley (see chapter 4)." (GSP at 3.55.)

This misstates the facts. It is clear that there is sufficient water in the Scott River system to sustain fish populations in almost every year. This is evident from the pre-1980 record showing that the river could sustain the USFS flow right and the CDFW recommended flows prior to the adjudication and the expansion of groundwater pumping. And it is clear from the information contained in the GSP that almost every year, precipitation is sufficient to bring flows up to a level that would support those flows for most of the year, absent irrigation. (See GSP at App. 4-A, at pp. 73-75.)

Therefore, the effects of stream depletion did not "exist" prior to 2015. Indeed, on January 1, 2015, the Scott River flowed at over 500 cfs, well above the CDFW-recommended 362 cfs.[5] The "undesirable result" for the purposes of SGMA is the disconnection and low flow in the river. (Wat. Code § 10721, def. (x)(6).) In the summer of 2015, growers made a choice to withdraw water from a full aquifer. And in 2015, just as in every prior summer, the County, the State Board, and other responsible agencies allowed the depletions to occur.

This does not mean that the undesirable result "existed." Courts have "long settled that separate, recurring invasions of the same right can each trigger their own statute of limitations." (*Aryeh v. Canon Business Solutions* (2013) 55 Cal.4th 1185, 1198.) This a similar situation: the stream depletions are not a continuous problem that occurred long ago and has not been corrected, like seawater intrusion or permanent subsidence. Depletions are discrete events that recur anew each year, but the GSP treats them as permanent. Indeed, the GSP claims that there is no chronic lowering of groundwater levels in the Scott. (GSP at 3.32.)

The GSP should be revised to make clear that the stream depletions did not "exist" prior to 2015 because each year they are caused again.

**10. The GSA's Baseline Analysis Must Include Consideration of Other Laws**

SGMA also does not absolve the County or the GSA of its duty to comply with other environmental laws. SGMA contains at least four explicit savings clauses making explicit that SGMA's requirements are in addition to, and do not replace, the requirements of other laws, including the Clean Water Act, the public trust doctrine, the state and federal Endangered Species Acts, or Fish and Game Code 5937, to name just a few.

SGMA's savings clauses include:

- "Nothing in this part, or in any groundwater management plan adopted pursuant to this part, determines or alters surface water rights or groundwater rights under common law or any provision of law that determines or grants surface water rights." (§ 10720.5, subd. (b).)
- "A groundwater sustainability agency may exercise any of the powers described in this chapter in implementing this part, in addition to, and not as a limitation on, any existing authority . . . ." (§ 10725, subd. (a).)

[5] USGS Flow Meter Data available at https://nwis.waterdata.usgs.gov/ca/nwis/uv/?ts_id=16566&format=img_default&site_no=11519500&begin_date=20150101&end_date=20150101

- "This part is in addition to, and not a limitation on, the authority granted to a local agency under any other law." (§ 10726.8, subd. (a).)
- "Nothing in this part is a limitation on the authority of the [State Water Board], the [Department of Water Resources], or the State Department of Public Health." (§ 10726.8, subd. (c).)[6]

The GSP purports to consider other laws. But it does so in the context of doing as little as possible to comply with those laws. The GSP states that SGMA requires it to only not cause more undesirable results than "existed" in 2015 (e.g. GSP at 3.60). But it characterizes any "additional" reduction in pumping as in response to the public trust doctrine the Clean Water Act, not SGMA. As discussed above, the conclusion that SGMA does not require further reductions below the 2015 baseline is incorrect. The analysis of undesirable results and minimum thresholds needs to be revised to take into account the requirements of all other relevant laws.

For instance, the analysis of temperature impacts is insufficient. Groundwater extractions reduce cold-water inflows. (GSP at 2.25.) And this occurs not just in the August-November period, but throughout the year. And some of these cold pools may exist in tributaries that are not part of the adjudicated area, such as the East Fork.[7] These areas would thus be fully under the jurisdiction of SGMA. But the GSP does not model or account for cold water refugia, which are crucial for salmonid over-summering and rearing, especially for Coho. (GSP at 2.73.) The TMDL Action Plan reinforces that these thermal refugia are necessary for species recovery: "Where reaches of the Scott River and its tributaries are providing suitable freshwater salmonid habitat, including cold water refugia for coho and other salmonids, protection of these areas should be a priority for restoration efforts."[8]

The GSP's failure to model and consider impacts of groundwater extraction on this crucial habitat implicates the Clean Water Act, by failing to comply with the TMDL for temperature, and the Endangered Species Act, for failing to protect critical habitat. Moreover, temperature impacts are an "effect" that the GSP wholly fails to evaluate the significance and reasonableness of when defining the undesirable result and minimum thresholds for either water quality or interconnected surface waters.

The GSP should, at the very least, incorporate a plan to identify and protect these cold water refugia where they occur.

**11. The GSP Fails to Consider Surface Water Quality**

The GSP's identification of undesirable results for water quality is insufficient because it fails to consider groundwater extraction's impacts to surface water quality. SGMA provides that "[s]ignificant and unreasonable degraded water quality" is an undesirable effect required to be avoided (Wat. Code § 10721, subd. (x)(4), and SGMA does not limit this definition to degraded *groundwater* quality. But the GSP limits its discussion of the water quality undesirable result to groundwater quality. (GSP at 3.42) This limitation violates SGMA because it does not consider the significant effects that groundwater conditions have on surface water quality, namely, temperature—including cold water refugia. The GSP acknowledges that the Scott is listed as impaired for temperature under section 303(d) of the Clean Water Act. (GSP at 2.23) And extractions of groundwater affect flows and therefore temperature in the Scott. (GSP at 2.25.)

---

[6] The "part" mentioned in each provision refers to Part 2.74 of the Water Code—that is, the entire Sustainable Groundwater Management Act. (§ 10720.)

[7] North Coast Regional Water Quality Control Board, Staff Report for the Action Plan for the Scott River Watershed Sediment and Temperature Total Maximum Daily Loads (2005) at p. 4-35.

[8] North Coast Regional Water Quality Control Board, Staff Report for the Action Plan for the Scott River Watershed Sediment and Temperature Total Maximum Daily Loads (2005) at p. 5-4.

The GSP must be revised to describe impacts to surface water temperature as an undesirable result and to develop minimum thresholds, measurable objectives, and projects and management actions to remedy the undesirable result.

**12. Additional technical comments to be incorporated by reference**

The Karuk Tribe supports and incorporates by reference the technical comments prepared by Riverbend Sciences on behalf of the Klamath Tribal Water Quality Consortium dated September 21, 2021 regarding review and comments on *Public Draft Scott Valley Groundwater Sustainability Plan.* These comments are attached.

**Comments on the Shasta Groundwater Sustainability Plan**

The Karuk Tribe supports and incorporates by reference the technical comments prepared by Riverbend Sciences on behalf of the Klamath Tribal Water Quality Consortium dated September 21, 2021 regarding review and comments on *Public Draft Shasta Valley Groundwater Sustainability Plan.* These comments are attached. Karuk-001

The Karuk Tribe hopes that the Groundwater Sustainability Agency/ Siskiyou County Flood Control & Water Conservation District will work to amend the draft plans based on the extensive feedback based on the legal and technical merits of the draft plans. The Karuk Tribes remains interested forging a collaborative relationship with the County despite the apparent lack of such interest by the County.

Yôotva,

Russell "Buster" Attebery
Karuk Tribe, Chairman

Cc: Anecita Augustinez
Tribal Policy Advisor
Department of Water Resources
P.O.Box 942836
Sacramento, CA 94236-0001

Patricia Vellines, P.G.
Regional Coordinator
Northern Region Office
Department of Water Resources
2440 Main Street
Red Bluff, CA 96080

Riverbend Sciences
1614 West Ave.
Eureka, CA 95501
(707) 832-4206
www.riverbendsci.com

# MEMORANDUM REPORT

To: Klamath Tribal Water Quality Consortium
From: Eli Asarian, Riverbend Sciences
Date: September 20, 2021
Re: Review and comments on *Public Draft Shasta Valley Groundwater Sustainability Plan*

---

The public draft of the "Shasta Valley Groundwater Sustainability Plan" was circulated for public comment by the Siskiyou County Flood Control & Water Conservation District in August, 2021. To assist the member Tribes of the Klamath Tribal Water Quality Consortium in the preparation of their comments, Riverbend Sciences and subcontractors have reviewed the document and prepared the comments provided here for the Tribes' use.

## A) COMMENT OVERVIEW

We have reviewed the public draft of the Shasta Valley Groundwater Sustainability Plan (GSP) and wish to provide the following comments. Our comments are arranged into three sections: A) Comment overview in which we provide a summary of our most important big-picture comments, B) comments on specific sections of the GSP chapters using the comment form provided.

A summary of our big-picture comments is provided in the following bullets, which are then discussed in the paragraphs below:

- The GSP lacks transparency
- Many GSP actions and goals sound great but are loosely defined so do not actually achieve much
- The GSP's monitoring plan is good, but without sufficient funding it cannot be implemented, and critical data gaps will remain unfilled
- The Minimum Threshold for Interconnected Surface Water should use direct measurements of springs, not a water balance that relies heavily on highly uncertain diversion estimates
- Parts of the GSP do not acknowledge the hydrologic reality of the sources of water to a well
- Even if the model will not be used for sustainable management criteria, it is still informative to look at its predictions for streamflow depletion
- The GSP does not deal appropriately with climate change

**The GSP lacks transparency**

Collaborative management and transparency and core tenants of SGMA. How will transparency and public access to data be incorporated into reporting and data sharing agreements? All data that is paid for with public money should be accessible to the public. All GSP reporting (i.e., annual and five-year review reports) should include electronic appendices with easily accessible data, so others could run their own analyses on the data. TC-001

We understand the political sensitivity of well metering, but how can groundwater be managed at a basinwide scale without metering? At least some subset of the wells should be mandated to be metered. Examples could include the largest wells, or new wells drilled after the passage of the SGMA legislation or after adoption of the Shasta Valley GSP. How can existing ordinances, such as the prohibition on the use of groundwater for cannabis production or the requirement for permits being needed for inter-basin transfers of groundwater, be enforced without the well metering? How can the effects of efficiency projects be verified without metering? The lack of metering requirements suggests a lack of transparency, which further suggests a lack of will to actually manage groundwater extraction. TC-002

We also have serious concerns with the lack of transparency with the current Scott Valley and Shasta Valley Watermaster District program. Watermastering should be returned to the State of California, with well-organized publicly accessible records of diversions. TC-003

**Many GSP actions and goals sound great but are loosely defined so do not actually achieve much**

The GSP full of things like that sound great like the "Avoiding Significant Increase of Total Net Groundwater Use from the Basin" project and management action (PMA), but when we look closely at the details we see that the wording is loosely defined so that it does not actually guarantee anything. Since all well metering is voluntary, how is it possible to verify this? TC-004

If the GSP is to actually achieve the stated objectives, it needs more things that can actually be readily verified. Examples that we recommend include:

- No additional wells for new land use or additional cropping will be permitted in the basin. Only new wells intended to replace old wells and existing crops will be permitted, and these replacement wells will be metered. The intent here is to avoid net increase in groundwater use.
- Wells intended to replace stream diversions will not be permitted, even if there will be no additional net water usage (i.e., pumped groundwater will be used to replace surface water irrigation of existing crops). The intent here is to allow the SWRCB to ascertain and regulate surface water rights and stream and spring flows. The use of groundwater wells in place of stream or spring diversions simply moves the point of diversion and lessens the ability of the SWRCB to carry out its mission.

**The GSP's monitoring plan is good, but without sufficient funding it cannot be implemented, and critical data gaps will remain unfilled**

We generally agree with sites and parameters proposed in Section 3.3 Monitoring Networks, but we are extremely concerned that funding will not be available to actually implement the monitoring. The GSA has a responsibility to provide the funding needed to collect these data. Without the monitoring, critical data gaps will persist and it will be impossible to understand or properly manage the intricate Shasta Valley groundwater system. TC-005

From our perspective, monitoring the flow of the springs is the most important. The output of these springs is what sustains aquatic ecosystems and agriculture in the Shasta River. In addition, the ability to predict flow in these springs is the primary endpoint upon which we will judge the performance of the Shasta Watershed Groundwater Model. We need to understand how groundwater elevations and groundwater pumping affect the flow in these springs. The monitoring plan proposes monthly monitoring of the springs, however, this is insufficient given the importance of these springs and the potential insights that high-resolution data could provide into the complex dynamics of Shasta Valley groundwater. At what time scales do the flow of these springs fluctuate (seasonal, weekly, daily, hourly, etc.) and what do these fluctuations appear to correspond with (e.g., Dwinnell reservoir levels, nearby groundwater pumps cycling on/off, flood irrigation, snowmelt, storm events, etc.)? How can we understand this without data? The two largest springs, Big Springs and Little Springs, are especially important. Other critically important springs that need continuous flow monitoring include Bridge Field Springs (on Shasta Springs Ranch, owned by Emmerson), Black Meadow Springs (on Shasta Springs Ranch, owned by Emmerson), Kettle Springs (on Shasta Springs Ranch, owned by Emmerson), and Hole in the Ground Spring. We noticed that Bridge Field Springs and Black Meadow Springs, were not included in the monitoring plan. We strongly urge that both these springs be added to the monitoring plan. TC-006

**The Minimum Threshold for Interconnected Surface Water should use direct measurements of springs, not a water balance that relies heavily on highly uncertain diversion estimates**

The GSP proposed a Minimum Threshold (MT) for Interconnected Surface Water (ISW) of 100 cfs groundwater contributions, based on a water balance of the Shasta River reach between Dwinnell Dam and the USGS flow gage near Montague. The estimated diversions used in the water balance are highly uncertain and unreliable, derived from private watermaster records. The bounds of uncertainty on these diversion estimates are so large as to make them nearly useless as a decision-making tool. Rather than estimating groundwater contributions based on a highly uncertain water balance, we would much rather have the MT ISW be based on the sum of measured discharges from key individual springs (i.e., Big Springs, Little Springs, Bridge Field Springs, Black Meadow Springs, Kettle Springs, and Hole in the Ground Spring). While these individual springs do not represent the entirety of the groundwater contributions (i.e., there may be some diffuse contributions as well as additional smaller springs), data on the spring flows are required anyway for management and model calibration, and should provide a more reliable relative metric of groundwater contributions than the water balance. There are not yet much data yet on these spring flows, but measurements need to begin as soon as possible. TC-007

**Parts of the GSP do not acknowledge the hydrologic reality of the sources of water to a well**

It is important to note that there are only three sources of water to a pumping well: 1) reductions in discharges from the system (e.g., discharges to streams and springs); 2) an increase in recharge to the system (capture of rejected recharge), and 3) change in storage (change in groundwater levels, which is only a temporary source of water and is not sustainable).

Because the Shasta work includes the entire watershed, item "2" would only result in robbing Peter to pay Paul – there is no net increase in yield when viewing the system as a whole. Item "3" is not important when looking at the long-term (sustainable) response of the system to pumping – it's only a matter of time before the impacts show up.

The point to be made here is that all groundwater pumping eventually comes at the expense of surface water systems (e.g., stream flow), the only real question is how long it will take for these depletion effects to reach the surface water systems. This delay is a function of distance from the stream and aquifer properties. It doesn't matter if the well is 10 feet or 10,000 feet from a surface water feature– the result will ultimately be impact to surface water features. This assumes that the basin does not simply go into overdraft, at which point there are no additional sources of surface water to deplete, or that they are already being depleted as rapidly as possibly given aquifer properties.

We highlight this issue because at times the GSP document seems to not acknowledge this fundamental physical reality. For example, from Chapter 3, page 46:

> As explained in the previous section, the lack of historical and high-frequency groundwater elevation data in the Basin, spatial gaps in streamflow and spring measurements, and uncertainty in the historical and current data regarding surface water diversions and groundwater does not allow the development of a reliable estimate of stream depletion due to pumping. Acknowledging these uncertainties and existing data gaps, the GSA finds it inappropriate to define the interconnected surface water SMC at this stage using modeled results of stream depletion. Instead, the GSA proposes as adaptive approach that would help improve the SMC setting in the future using newly collected data while addressing SGMA requirements…

TC-008

What other long-term source of water is there for the wells (see Theis, 1940, The Sources of Water Derived from Wells)? It is important to strike "…does not allow the development of a reliable estimate of stream depletion due to pumping." and replace with something like " …makes current model predictions of location and timing of impacts uncertain."

**Even if the model will not be used for sustainable management criteria, it is still informative to look at its predictions for streamflow depletion**

The GSP states that the model is not complete and therefore was not used for assessing sustainable management criteria. A primary reason given for this is lack of data. Our comment regarding this issue (Chapter 3, page 30) is:

> The text states "*The goal is to use this approach for the first 5 years of implementation, collect more data, and at the GSP update provide a stream depletion approach based on more reliable results produced by the further calibrated SWGM*." Two fundamental questions regarding groundwater development in the Shasta Valley are "What effect has past and present groundwater

TC-009

pumping had on surface-water flow in the Shasta River, tributaries, and springs in the Valley?" "What effect will future groundwater pumping have on surface-water resources in the Shasta Valley?" From the stated text, it seems that the Shasta Watershed Groundwater Model (SWGM) will not be used to answer these questions for at least 5 years. If the groundwater part of the model can be used to calculate water budget components as has already been done, why can't it be used to calculate streamflow depletions? Conversely, if the model can't be used to reliably calculate streamflow depletions, why can it be used to calculate water-budget components? Using a groundwater model, streamflow depletion from groundwater pumping is always determined using model-calculated water budget components. At this stage of development of the groundwater model, uncertainty in computed streamflow depletion will most likely be in the timing of the depletion, rather than the relative amounts that various surface-water features are affected. In five years, there will still be uncertainty in the timing of depletion, but perhaps that uncertainty will be lower. Nonetheless, a delay of five years in tackling fundamental questions seems to be ignoring the current value of the model. If key calculations were run and re-run as the model was being improved, then the modelers would learn the sensitivity of model results to changes in parameters.

TC-009 contd.

We would add that the modeling process itself is an invaluable tool in gaining stakeholder buy-in on the local physical conditions and the model itself. This buy-in is especially important down the road when the model is used to make critical decisions. Letting stakeholders clearly see the difficulties in simplifying the system for input into the computer program and illustrating the uncertainties that arise from data gaps is invaluable as part of building trust. Unfortunately, this was not our experience on this project.

**The GSP does not deal appropriately with climate change**

The GSP appears to treat climate change as a check-the-box exercise rather than seriously grappling with what it will mean for groundwater management. The GSP does include model runs for future climate change, these results are not presented in a coherent way that highlights the major challenges that climate change will pose to water management. A warming climate will cause a shift in precipitation form (less snow, more rain) that will in turn shift the seasonal timing of tributary surface flows into the valley. Regardless of what happens to total precipitation or total runoff, this change in precipitation form and runoff timing is a huge issue that water management is going to need to recon with. Perhaps we missed it (and if so, we apologize), but we did not see evidence that the GSP recognizes the severity of the coming changes to climate, nor presents a coherent plan to adapt to it.

TC-010

**B) COMMENTS ON SPECIFIC GSP SECTIONS USING THE COMMENT FORM PROVIDED**

| Chapter | Page | Section | Line/Table/ Figure # | Comment | |
|---|---|---|---|---|---|
| 2 | 79 | 2.2.1.5 | 1500-1504 | "Streamflow data from all available sources will be further assessed during hydrologic model development to identify important critical conditions. Data quantity and quality impact both selection of data to be used for calibration and interpretation of model performance during associated time periods. More weight is given to locations and time periods with higher quality data." This wording seems to suggest this work was not done as part of model calibration to date, but this appears incorrect, true? If so, it should be reworded in past tense. | TC-011 |
| 2 | 87-91 | 2.2.2.2 | Figure 35-39 | Based on the values this is, indeed, a depth to water map, but then it is not an "Elevation Map" as stated. It is a bit confusing as it appears to show cones of depressions in the far eastern and western areas, but as the land is sloping it is not clear how much these values reflect changes in land surface elevation versus water groundwater surface elevation. Why not present WL elevation maps and depth to water maps separately? In the latter case, it would be good to include a more detailed land surface elevation map than that provided in Figure 6 (which is in 2,000 foot increments). | TC-012 |
| 2 | 107 | 2.2.2.6 | 2071 | This is supposed to read "south to north" not "~~north to south~~", right? | TC-013 |
| 2 | 108 | 2.2.2.6 | 2124-2166 | We assume these measurements will continue into the future and measurements obtained throughout the year. This is important because winter periods may prove best for understanding the ultimate degree of GS/SW interaction because of the lack of nearby irrigation pumping. In addition, a year-round analysis would provide a fuller picture of this interaction. | TC-014 |
| 2 | 111 | 2.2.2.6 | 2128 | It is coinciding, so suggest following edit: "~~potentially coinciding~~" to "coincident". | TC-015 |
| 2 | 133-134 | 2.2.2.7 | 2433, Figure 58 | Why are these maps (Figure 58 and in Appendix 2-G) so different from Figures 35-39? Is it simply a matter of scale? Suggest replacing Figures 35-39 with these figures and including WL Elevation maps separately. | TC-016 |
| 2 | 136-137 | 2.2.2.7 | 2506, Figure 59 | Why is this survey considered a maximum and not a minimum possible extent? There are a lot of acknowledged generalizations in this section. We would think you'd want a relatively quick field check before dismissing all the "Assumed not a GDE" areas. In addition, as noted, perched zones were not captured in the analysis. Recommend that you include something like "Representative areas currently classed as 'Assumed not a GDE' will be reviewed in the field as part of future work". | TC-017 |
| 2 | 138 | 2.2.3 | Figure 60 | This graph (or an additional one) should include change in storage through time. | TC-018 |

| Chapter | Page | Section | Line/Table/ Figure # | Comment | |
|---|---|---|---|---|---|
| 2 | 138 | 2.2.3 | Figure 60 | It is important that groundwater ET be modeled explicitly in the GSFLOW model to better understand and illustrate the changes in amount and location of potential impacts to GDEs through time in areas of shallow water tables. We assume this was done. In any case, it is easy to do in MODFLOW by adding in an ET surface corresponding to ground surface with general groundwater ET extinction point rules. We assume there is a comparable simple way to do this in GSFLOW. This needs to be reported as part of the water budgets (Figures 60-61). This would be in addition to the analysis mentioned on page 141, which we don't fully understand – given groundwater ET changes as a function of WLs, how could it be calculated ahead of time and then used as input? We realize we may misunderstand this. Clarification in the text would be very useful. | TC-019 |
| 2 | 138 | 2.2.3 | 2521-2531 | It appears that you deem domestic and public pumping to be inconsequential. We do not necessarily disagree, but an estimate of these values needs to be provided to substantiate this position. | TC-020 |
| 2 | 141 | 2.2.3.1 | 2603-2609 | It is important that the GSFLOW model be used to calculate groundwater ET because the water table fluctuates through time due to changing stresses. What is the benefit to calculating this outside the model and then using it as input? | TC-021 |
| 2 | 143 | 2.2.3.1 | Table 15 & 16 | Delete one of the "~~within the~~" in each, and in Table 16 we think you mean watershed boundary, not ~~Basin~~ boundary | TC-022 |
| 2 | 144 | 2.2.3.1 | Table 18 | Looks like Average and Maximum values are reversed for Agricultural Pumping, or one of the values is erroneous. | TC-023 |
| 2 | 145 | 2.2.3.4 | 2695 | "Winter rains and winter/spring runoff ~~fill~~recharge the aquifer system between October and April (Figure 23)." Replace ~~fill~~ with recharge. If it filled there wouldn't be many of the issues we are dealing with here. | TC-024 |
| 2 | 146 | 2.2.3.4 | 2731-2734 | "The response of the groundwater discharge to the stream system will be delayed relative to the timing of the changes in pumping or recharge – by a few days if changes occur within a few tens or hundreds of feet of a stream, by weeks to months if they occur at larger distances from the stream." This statement requires proof. Assuming delay calculations were performed for the local aquifer they should be included somewhere in the document. | TC-025 |
| 2 | 151 | 2.2.4.2 | Figure 67 | "Baseline" line should be removed from graph and legend because it is confusing and same color as "Wet" | TC-026 |

| Chapter | Page | Section | Line/Table/ Figure # | Comment | |
|---|---|---|---|---|---|
| 2 | 151 | 2.2.4.2 | Figure 67 | "Figure 67. Projected flow at the Shasta River near Yreka gage, in difference (cfs) from Baseline, for four future projected climate change scenarios" Perhaps we are mis-understanding what these scenarios are, but are extremely skeptical of any claims that the temperature-driven changes in precipitation form due to climate change (i.e., more rain and less snow) are not going to substantially decrease river flows in summer and fall, regardless of what happens to total annual amount of precipitation. The GSP should acknowledge these realities and then describe how the model predicts that this will seasonally change river flow and groundwater. The format of the graph makes it very difficult to see meaningful seasonal patterns. The y-axis scale that ranges from -2,000 to +12,000 cfs makes it impossible to see what is happening during low flows. Can you add a second panel that to graph so that the low-flow period is legible (maybe -100 to +100 cfs?)? Or maybe limit the months to just show April through October? | TC-027 |
| 2 | 151 | 2.2.5 | 2816-2818 | Delete "~~Groundwater pumping has not caused significant and unreasonable conditions in the Basin during the last 20 years~~". The Basin has recognized problems and is a Medium Priority to the State and its why we are doing this SGMA Plan. You can say it's not in overdraft (continuously declining WLs), but that's it. | TC-028 |
| 2 | 151 | 2.2.5 | 2827 | Suggest: "…acre-feet per ~~year minus any future~~ reduction in…" to "…acre-feet per year. It may change in the future due to reduction in…" | TC-029 |
| 2 | 152 | 2.2.5 | 2849-2857 | It appears you are saying that the sustainable yield is less than the current value of pumping. The sustainable yield needs to be defined as part of this SGMA plan and then used as the management target. As it is currently worded in the document, there is apparently no lower limit to reductions in pumping. | TC-030 |
| | | | | | |
| 3 | 5 | 3.2 | 114-116 | The first sustainability goal listed is "Groundwater elevations and groundwater storage do not significantly decline below their historically measured range, protect the existing well infrastructure from outages, protect groundwater-dependent ecosystems, and avoid significant additional stream depletion due to groundwater pumping." There is not definition of what "significant" means, so we suggest removing that word. Without a definition, isn't this meaningless? It should probably either be percent (e.g., 1%) or volume? | TC-031 |
| 3 | 5 | 3.2 | 123 | In "Groundwater will continue to provide river baseflow as interconnected surface water with no ~~significant or unreasonable~~further reduction in volume." strike "~~significant or unreasonable~~" and replace with "further'. Without a definition, significant is too vague. | TC-032 |

| Chapter | Page | Section | Line/Table/ Figure # | Comment | |
|---|---|---|---|---|---|
| 3 | 6-33 | | | We generally agree with sites and parameters proposed in Section 3.3 Monitoring Networks, but we are extremely concerned that funding will not be available to actually implement the monitoring. As described in our comments on Chapter 3, Section 3.3, pages 16-17, Table 1, we also recommend continuous flow monitoring of the springs, and adding two additional springs to the flow monitoring sites: Bridge Field Springs and Black Meadow Springs. | TC-033 |
| 3 | 16-17 | 3.3 | Table 1 | From our perspective, monitoring the flow of the springs is the most important. The output of these springs is what sustains aquatic ecosystems and agriculture in the Shasta River. In addition, the ability to predict flow in these springs is the primary endpoint upon which we will judge the performance of the Shasta Watershed Groundwater Model. We need to understand how groundwater elevations and groundwater pumping affect the flow in these springs. The monitoring plan proposes monthly monitoring of the springs, however, this is insufficient given the importance of these springs and the potential insights that high-resolution data could provide into the complex dynamics of Shasta Valley groundwater. At what time scales do the flow of these springs fluctuate (seasonal, weekly, daily, hourly, etc.) and what do these fluctuations appear to correspond with (e.g., Dwinnell reservoir levels, nearby groundwater pumps cycling on/off, flood irrigation, snowmelt, storm events, etc.)? How can we understand this without data? The two largest springs, Big Springs and Little Springs, are especially important. Other critically important springs that need continuous flow monitoring include Bridge Field Springs (on Shasta Springs Ranch, owned by Emmerson), Black Meadow Springs (on Shasta Springs Ranch, owned by Emmerson), Kettle Springs (on Shasta Springs Ranch, owned by Emmerson), and Hole in the Ground Spring.<br><br>We noticed that Bridge Field Springs and Black Meadow Springs were not included in the monitoring plan. We strongly urge that both these springs be added to the monitoring plan. | TC-034 |
| 3 | 6 | 3.3 | 155 | "A detailed discussion of potential data gaps, and strategies for resolving them, is included as Appendix 3-A~~Z~~" | TC-035 |
| 3 | 25 | 3.3.3.1 | Table 3 | Specific conductivity can readily be obtained at the wellhead using a meter. We suggest taking annually when sampling for nitrate. | TC-036 |
| 3 | 28 | 3.3.4.1 | 458-472 | Suggest using WLs from "permanent" stilling well in stream and WLs from two nearby adjacent piezometers at different depths to track changes in gradients through time. | TC-037 |

| Chapter | Page | Section | Line/Table/ Figure # | Comment | |
|---|---|---|---|---|---|
| 3 | 29 | 3.3.4.1 | Figure 6 | Should "gradient near Scott River" be changed to "gradient near Shasta River?" If you did mean this to be for the Scott River, then some discussion should be added to justify using conditions in the Scott Valley for analyses in the Shasta valley. Also, not all information is given in explaining the generation of 70 cfs of baseflow for a single water-level gradient. That gradient would have to apply to some length of the river. Is the baseflow number for the entire basin? And would one water-level gradient explain that number (70 cfs)? Normally the quantity would be given as "cfs per unit length of river," or "cfs for reach X," where reach X has some defined length. | TC-038 |
| 3 | 29 | 3.3.4.1 | Figure 6 caption | This caption seems to be for a map figure, not for the schematic cross section shown. | TC-039 |
| 3 | 30 | 3.3.4.1 | 490-492 | The text states "*The goal is to use this approach for the first 5 years of implementation, collect more data, and at the GSP update provide a stream depletion approach based on more reliable results produced by the further calibrated SWGM*." Two fundamental questions regarding groundwater development in the Shasta Valley are "What effect has past and present groundwater pumping had on surface-water flow in the Shasta River, tributaries, and springs in the Valley?" "What effect will future groundwater pumping have on surface-water resources in the Shasta Valley?" From the stated text, it seems that the Shasta Watershed Groundwater Model (SWGM) will not be used to answer these questions for at least 5 years. If the groundwater part of the model can be used to calculate water budget components as has already been done, why can't it be used to calculate streamflow depletions? Conversely, if the model can't be used to reliably calculate streamflow depletions, why can it be used to calculate water-budget components? Using a groundwater model, streamflow depletion from groundwater pumping is always determined using model-calculated water budget components. At this stage of development of the groundwater model, uncertainty in computed streamflow depletion will most likely be in the timing of the depletion, rather than the relative amounts that various surface-water features are affected. In five years, there will still be uncertainty in the timing of depletion, but perhaps that uncertainty will be lower. Nonetheless, a delay of five years in tackling fundamental questions seems to be ignoring the current value of the model. If key calculations were run and re-run as the model was being improved, then the modelers would learn the sensitivity of model results to changes in parameters. | TC-040 |
| 3 | 30 | 3.3.4.2 | 502-511 | Suggest incorporating the in-stream stilling well and adjacent vertical gradient piezometers as future improvements | TC-041 |
| 3 | 30 | 3.3.4.2 | Table 5 | We are confused why the "Shasta River near Yreka (SRY)" is listed in the Table 5 "Future monitoring locations for monitoring" with the Agency listed "NA"? Isn't that a long-term flow gage that has been operated for decades by the USGS? | TC-042 |

| Chapter | Page | Section | Line/Table/ Figure # | Comment | |
|---|---|---|---|---|---|
| 3 | 31 | 3.3.4.3 | | "Surface diversions will be entered into the County data management system" Please describe whether or not these data will be publicly accessible. Data collected for demonstrating SGMA compliance should be publicly accessible. | TC-043 |
| | | | | | |
| 3 | 35 | 3.4.1.1 | 607 | You appear to use Management Trigger as a formal term, but it is not in Acronym list and is only used here. If used it should be formally defined and listed in Acronyms (would conflict with Minimum Threshold) | TC-068 |
| 3 | 36 | 3.4.1.2 | 641-642 | Suggest change "the ~~historic low~~" to "the historic smallest depth to groundwater" | TC-044 |
| 3 | 36-37 | 3.4.1.2-.3 | 641, Table 6, Fig 8 | Why is MT set below historic low? This conflicts with previous statements of trying to reduce GW pumping and maintain or raise WLs (see Section 2.2.5) | TC-045 |
| 3 | 37 | 3.4.1.3 | Table 6 | "AT" is not in Acronym list. | TC-046 |
| 3 | 41 | 3.4.3.1 | 772-773 | It is not at all clear why municipal water users are apparently de minimis. No data have been supplied to support this claim. | TC-047 |
| 3 | 42 | 3.4.3.2 | 787-792 | "The GSA will not be using a numerical groundwater-surface water model to evaluate ISW at this time. A temporary approach based on baseflow calculation will be used." We strongly suggest using the model in parallel with the planned approach to better understand model behavior recalibration (as you note in 3.4.3.6). | TC-048 |
| 3 | 43 | 3.4.3.2 | Equation, table 7 | Some additional explanation would be helpful. First, mention somewhere that change in storage in the reach is assumed to be zero. We suggest changing "$SRM$ is flow out of the USGS maintained SRM gage" to "$SRM$ is flow at USGS maintained Shasta River near Montague (SRM) gage 11517000, located at the downstream end of the reach" A schematic with arrows for various components would help. More importantly, some sort of error analysis should be done to determine uncertainty in groundwater contributions. If an uncertainty can be estimated for each of the components of the water budgets, an analysis can be carried out to determine uncertainty in computed groundwater contributions. | TC-049 |

| Chapter | Page | Section | Line/Table/ Figure # | Comment | |
|---|---|---|---|---|---|
| 3 | 42-44 | 3.4.3.2 | 784-832 | A very important factor that does not appear to us to be mentioned in "Information and Methodology Used to Establish Minimum Thresholds and Measurable Objectives" is that there appears to be no accounting for return flows such as tailwater. If much of the irrigation along this reach of the river uses flood irrigation (i.e., in contrast to sprinklers), then isn't there a substantial quantity of tailwater that returns to the river from agricultural fields? If tailwater returns are not accounted for, then "baseflow" could be substantially overestimated in the methods described. While there are some records of tailwater quantities (i.e., from the SVRCD reports), it likely is not possible to estimate these quantities very accurately. But wouldn't it be better to at least make some educated guess about the percent of the diversions that return as tailwater (e.g., perhaps it is in the range of 10-50%) and include that in the calculation, instead of completing ignoring it? You are calling it "Groundwater Contributions" so, it should be your best estimate of groundwater. If you don't apply an adjustment for tailwater, then you should call it something else, like "Groundwater Contributions Plus Tailwater Returns," otherwise it is misleading. We do not have access to the all the reports and data sources cited in the chapter, so perhaps tailwater was indeed already accounted for and we are not aware of it, but from the descriptions provided in the GSP it appears that tailwater was ignored. | TC-050 |
| 3 | 43 | 3.4.3.2 | 821 | We suggest changing "Riparian diverters are not measured" to "Riparian diverters are not measured, despite requirements to measure and report diversions under California Senate Bill 88" | TC-051 |
| 3 | 45 | 3.4.3.4 | 846 | The proposed Minimum Threshold (MT) for Interconnected Surface Water (ISW) is 100 cfs of groundwater contributions, based on a water balance of the Shasta River reach between Dwinnell Dam and the USGS flow gage near Montague. The estimated diversions used in the water balance are highly uncertain and unreliable, derived from private watermaster records. The bounds of uncertainty on these diversion estimates are so large as to make them nearly useless as a decision-making tool. Rather than estimating groundwater contributions based on a highly uncertain water balance (i.e., not the dramatic week to week fluctuations in Table 7), we would much rather have the MT ISW be based on the sum of measured discharges from key individual springs (i.e., Big Springs, Little Springs, Bridge Field Springs, Black Meadow Springs, Kettle Springs, and Hole in the Ground Spring). While these individual springs do not represent the entirety of the groundwater contributions (i.e., there may be some diffuse contributions as well as addition smaller springs), data on the spring flows are required for anyway for management and model calibration, and should provide a more reliable relative metric of groundwater contributions than the water balance. There are not yet much data yet on these spring flows, but measurements need to begin as soon as possible. | TC-052 |

| Chapter | Page | Section | Line/Table/ Figure # | Comment | |
|---|---|---|---|---|---|
| 3 | 46-47 | 3.4.3.6 | 906-913 | What other long-term source of water is there for the wells (see Theis, 1940, The Sources of Water Derived from Wells)? It is important to strike "…~~does not allow the development of a reliable estimate of stream depletion due to pumping~~." and replace with something like " …makes current model predictions of location and timing of impacts uncertain." | TC-053 |
| 4 | 14 | 4.2 | 304 | The "Avoiding Significant Increase of Total Net Groundwater Use from the Basin" PMA does not provide a definition of what "significant" means, so we suggest removing that word. Without a definition, isn't this PMA meaningless? It should probably either be percent (e.g., 1%) or volume? See related comment regarding Chapter 4, page 19, section 4.2, line 505-508. | TC-054 |
| 4 | 14 | 4.2 | 326-331 | We are unable to understand exactly what the "Avoiding Significant Increase of Total Net Groundwater Use from the Basin" PMA means, especially, this excerpt: "Due to the direct relationship between net groundwater use and ET, implementation of the MA is measured by comparing the most recent five- and ten-year running averages of agricultural and urban ET over both the Basin and watershed, to the maximum value of Basin ET measured in the 2010-2020 period, within the limits of measurement uncertainty." Can it be re-stated more clearly, such as, "The goal of this MA is for X not to exceed Y by Z percent?" Can you provide information on the limits of measurement uncertainty? What is the rationale for using the maximum as the basis for the comparison? Is the purpose of the running averages to smooth out climatic variation (i.e., is ET higher in wet years than dry years)? If there is substantial variation between water year types, then should the goal be different in different water year types? What about the contribution of surface water irrigation to ET? We anticipate that climate change will cause increased reliance on groundwater because surface water flows are going to recede earlier in the irrigation season (due less snowmelt), which could result in ET staying the same but groundwater extraction will increase and flows be lower, all without violating this MA. | TC-055 |
| 4 | 15 | 4.2 | 341-343 | "To be flexible in adjusting the limit on total net groundwater extraction if and where additional groundwater resources become available due to additional recharge dedicated to later extraction." Groundwater is already over-extracted, and there is not extra water available to use in enhancing recharge. See comments on Chapter 4, Section 4.3, page 30, line 895. | TC-056 |
| 4 | 19 | 4.2 | 505-508 | "The permitting program would ensure that construction of new extraction wells does not significantly expand current total net groundwater use in the Basin (to the degree that such expansion may cause the occurrence of undesirable results)." How are "undesirable results" defined? Please add a definition or citation here. See related comment regarding Chapter 4, page 14, section 4.2, line 304. | TC-057 |

| Chapter | Page | Section | Line/Table/ Figure # | Comment | |
|---|---|---|---|---|---|
| 4 | 19 | 4.2 | 513-514 | "Here are two illustrative examples of an appropriate use of well replacement…" … "Example 2: Replacement of a 1,000-gpm agricultural well that will be properly decommissioned with a new 2,000-gpm capacity agricultural well is permissible with the explicit condition that the 10-year average total net groundwater extraction within the combined area serviced by the old and the new well does not exceed the average groundwater extraction over the most recent 10-years." Since groundwater use is mostly unmetered (much less publicly accessible), how would this be tracked or enforced? | TC-058 |
| 4 | 23 | 4.2 | 659-667 | The proposed monitoring of irrigation efficiency omits a key tool– metering of water use. Without metering, how can we know if the efficiency projects are actually working? | TC-059 |
| 4 | 23 | 4.2 | 659-667 | The proposed monitoring of irrigation efficiency lists "Assessment of the increase in irrigation efficiency, with particular emphasis on assessing the reduction or changes in consumptive water use (evaporation, evapotranspiration) based on equipment specification, scientific literature, or field experiments." Doesn't efficiency usually not affect consumptive water use but instead just change recharge (that's how it is represented in the SVIHM, right?). What is the physical basis for thinking efficiency would affect consumptive use for crops like pasture and alfalfa that have low-lying continuous canopy cover (i.e., in contrast to orchards or row crops like tomatoes where efficient delivery systems like drip irrigation could reduce evaporation from bare soil)? | TC-060 |
| 4 | 25 | 4.2 | 668 | "Juniper Removal: The GSA, USGS and other agencies and private stakeholders will remove excess juniper within the watershed to improve groundwater levels." While it is conceptually possible to increase water yield for some number of years following juniper removal, it is difficult to actually implement at a watershed scale and maintain it over time. Furthermore, juniper removal will not necessarily increase water yield in all climates, so local conditions should be evaluated (Niemeyer et al. 2017). Such projects should be considered within a holistic management framework that re-establishes historical fire regimes and does not focus solely on water yield. Maintenance would be needed because the benefits of one-time removal projects are likely to be short-lived (Fogarty et al. 2021). References:<br>Fogarty, D. T., de Vries, C., Bielski, C., & Twidwell, D. (2021). Rapid Re-encroachment by Juniperus virginiana After a Single Restoration Treatment. Rangeland Ecology & Management, 78, 112–116. https://doi.org/10.1016/j.rama.2021.06.002.<br>Niemeyer, R. J., Link, T. E., Heinse, R., & Seyfried, M. S. (2017). Climate moderates potential shifts in streamflow from changes in pinyon-juniper woodland cover across the western U.S. Hydrological Processes, 31(20), 3489–3503. https://doi.org/10.1002/hyp.11264 | TC-061 |

| Chapter | Page | Section | Line/Table/ Figure # | Comment | |
|---|---|---|---|---|---|
| 4 | 30 | 4.3 | 895 | Given that there is already a dam in place that captures winter runoff from the upper Shasta River watershed, we oppose the Managed Aquifer Recharge (MAR) or In-Lieu Recharge (ILR) PMA. Dwinnell Dam already reduces winter and spring flows enough that there are not sufficient high flows to maintain natural geomorphic processes in the Shasta River. There is no "extra" water in the Shasta River that can be used to recharge groundwater. The way to improve groundwater conditions is demand reduction. | TC-062 |
| 4 | 32 | 4.3 | 954 | We support the Strategic Groundwater Pumping Curtailment PMA. | TC-063 |
| | | | | | |
| App 2-E | 10 | | | We did not receive this appendix with the model documentation until September 13, so did not have time to review it in detail. Many sections of it appear to only be partially complete. We look forward to reviewing this when it is complete. | TC-064 |
| App 2-I | 8 | | | How do the total evapotranspiration of applied water (ETaw) and precipitation (ETpr) values calculated in this report compare with previous estimates such as from CDWR Land and Water Use Estimates (https://water.ca.gov/Programs/Water-Use-And-Efficiency/Land-And-Water-Use/Agricultural-Land-And-Water-Use-Estimates), and/or the remote-sensing based Baldocchi et al. (2019)? Full citation: Baldocchi, D., Dralle, D., Jiang, C., & Ryu, Y. (2019). How Much Water Is Evaporated Across California? A Multiyear Assessment Using a Biophysical Model Forced With Satellite Remote Sensing Data. Water Resources Research, 55(4), 2722–2741. https://doi.org/10.1029/2018WR023884 | TC-065 |
| | | | | | |
| App 3-A | 10 | | Table 2 | Why are flow gages not listed in the Table 2 Data Gap Prioritization? Shouldn't measuring the flow rates of the largest springs (i.e., Big Springs, Little Springs, etc.) be the highest priority? We do not understand how it will be possible to calibrate groundwater model without having data for these springs. | TC-066 |
| App 3-A | 11 | | Table 2 | The groundwater extraction row of Table 2 says "No strategy has been defined yet to fill this data gap. Only voluntary measures are being considered to gathered extraction data." This is disappointing. How can groundwater be effectively managed without data about how much groundwater is being pumped? | TC-067 |
| | | | | | |

Quartz Valley Indian Reservation

September 22, 2021

To: Siskiyou County Flood Control and Water Conservation District

From: Quartz Valley Indian Community

**RE: Scott River Groundwater Sustainability Plan Comments**

Chairman Kobseff,

We thank you this opportunity to provide comments on the Scott Valley Groundwater Sustainability Plan (GSP). The Quartz Valley Indian Community (QVIC) sees this process enacted by the Sustainable Groundwater Management Act (SGMA) as an important and necessary step towards ecological balance in the Scott River system. The demands of drinking water, agriculture and the environment have been competing for decades and drought conditions of recent years are exacerbating this issue.

As you are aware, the QVIC was granted a seat on the Scott Groundwater Advisory Committee (SGAC). Our staff was an active participant throughout the entire process reviewing materials and providing verbal and written comments. We feel that many of these comments were not adequately addressed in the development of the current draft of the GSP. SGMA was enacted to be a collaborative process and we were hopeful that this would be a first step in working with our neighbors to develop a GSP that could meet all the needs of the Scott community. We never expected that the SGMA process would resolve all the water problems in the valley, in part because SGMA only applies to a subset of groundwater users (i.e., those not already covered by the existing water rights adjudications) and does not apply to surface water users. However, we are disappointed that the GSP did not propose more ambitious steps towards addressing the critical lack of instream flows in the river during summer and fall. Instead of providing long-term solutions, the GSP seems primarily aimed at continuing the status quo, with only slight improvements proposed. We can envision a future in which fish have the water they need to survive, and farmers and ranchers have secure access to the water needed for their operations; however, the GSP does not do enough to bring that vision closer to becoming reality. Many of the comments herein have already been stated throughout the development of the GSP, we also had an additional technical review from our consultants during this public comment period. QVIC-001

The technical review has revealed a concerning weakness in the model, particularly in October and November when the groundwater basin is transitioning between draining and filling, those details are included herein. This is most concerning to the Tribe since this is when our salmon are in the Scott system trying to access as much habitat as possible to spawn. We feel that these modeling weaknesses could be refined and alleviated through a more robust monitoring program throughout the valley. On the ground information, through data collection and sharing, will be necessary to build our trust in the accuracy of the model being used to manage the Scott system. QVIC-002

A significant legal analysis of the GSP was provided to QVIC by the Karuk Tribe, and we have included those comments herein. These legal issues have created uncertainty in the development of the GSP and we feel, had they been resolved early on, a better GSP could have been produced.

We hope these comments are useful and can lead to a final draft that is working toward restoration and a water management strategy that is effective at meeting the needs the Scott River basin.

Administration: 530-468-5907 Fax: 530-468-5908

13601 Quartz Valley Road, Fort Jones, CA 96032

We have also attached a Technical Memorandum developed by our consultants on the Shasta GSP. Many of the same legal questions apply to the Shasta GSP as well. Although QVIC staff were focused on the Scott GSP development, the Tribe has ancestral lands in the Shasta basin and development of a solid GSP is just as important there as in the Scott River basin to QVIC membership.

QVIC-003

Thank you and please contact my staff lead, Crystal Robinson, Environmental Director crystal.robinson@qvir-nsn.gov, if you have any technical questions or follow up to these comments.

Sincerely,

Harold Bennett, Tribal Chairman

Quartz Valley Indian Reservation

# Attachment C – Shasta Valley Groundwater Sustainability Plan Comment and Comment Response Matrix

| Author | CIN | Group | Sub-Category | Description | Code/Regulation | Chapter | Page | Section | Line/ Table/ Fig # | Comment | Response / Recommended Action |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ginger Sammito | GS-001 | C | DW | Domestic Well Definition | | 2 | 8 | 1.1.1 | 151-153 | Need to define what constitute a domestic well upper bound. Is it 450 gpm? 100gpm? | A domestic well is defined by a well that pumps potable groundwater for personal use. |
| Ginger Sammito | GS-002 | C | HM | Specific Edit to Plan Requested | | 2 | 35 | 2.2.1.2 | figure#8 | Graph depicts data up to 2005 yet verbiage states 2020 | Edit complete. |
| Ginger Sammito | GS-003 | C | HM | Specific Edit to Plan Requested | | 2 | 39 | 2.2.1.2 | Figure #12 | Need to define xxx place holders. Probably just overlooked | Figure was updated. |
| Ginger Sammito | GS-004 | C | WI | Well Pumping Reporting | | 3 | 7 | 3.3 | 178-188 | What about large capacity well which are on large generators and do not have a large land base case in point is APN: 019-661-410-000 which has a 2,500-gallon capacity well on 4.06 acres. | Volunteers with this well type is welcome to voluntarily report their usage. There is also a PMA on volunatry well metering in Chapter 4. |
| Ginger Sammito | GS-005 | C | MN | Specific Edit to Plan Requested-Groundwater Monitoring Figure | | 3 | 9,10 | | Figure 1,2 | x-axis needs to be cleaned up. Maybe just being/end value | The figures have been updated. |
| Ginger Sammito | GS-006 | C | GL | Specific Edit to Plan Requested-Chronic Lowering of Groundwater Levels | | 3 | 35 | 3.4.1.1 | 599-605 | Excessive number is ambiguous statement. What number determined excessive? | See MCR "SGMA" |
| Ginger Sammito | GS-007 | C | IS | Specific Edit to Plan Requested | | 3 | | 3.4.3.2 | Table 7 | What is the significance defined by the asterisk next to the values? Maybe just need a statement here. | Edit complete. |
| Ginger Sammito | GS-008 | C | WR | Specific Edit to Plan Requested | | 4 | 4 | 4.1 | 153 | A permit is required for extraction within and outside basin now | See Section 2.1.4.3. |
| Ginger Sammito | GS-009 | C | TR | Data Access, Transparency | | 4 | 14 | 4.2 | 335 | The only way to acquire valid data is to house the well drillers report within this county so the information will be readily available to SGMA | Noted |
| California Trout | CT-001 | C | GL | Specific Edit to Plan Requested | | ES | 3 | ES-1 | 98 | Available for the Basin dates back to ~~e~~at least (typo) | Edit complete. |
| California Trout | CT-002 | C | GL | Specific Edit to Plan Requested | | ES | 3 | ES-1 | 101 | What is Error! Reference source not found? | Edit complete. |
| California Trout | CT-003 | C | GE | Specific Edit to Plan Requested | | 2 | 4 | 2.1.1 | 91 | cover ~~a~~ the northern (typo) | GSP text corrected. |
| California Trout | CT-004 | C | BR | Public Trust Doctrine, Interconnected Surface Water | | 2 | 12 | 2.1.2 | 162 | This section never mentions the Public Trust Doctrine despite the GSP acknowledging that groundwater and surface water in the basin are interconnected (line 110) | See MCR "Public Trust" |
| California Trout | CT-005 | C | WB | Data Uncertainty-Illegal Cannabis | | 2 | 28 | 2.1.4.2 | 695-697 | "[t]here is not substantial enough data to include groundwater use estimates from illegal cannabis production in the overall and future water budgets." → How can the GSA ensure accurate water budgets if it excludes this potentially significant, albeit illegal, use of groundwater? | The commenter acknowledges that illegal cannabis production is only potentially significant highlighting the uncertainty in quantifying the groundwater use. Adding a groundwater use term for illegal cannabis production in the groundwater model would introduce more uncertainty into the model results because there is no conclusive data yet on illegal cannabis production, thus including this groundwater use may create a less accurate water budget. This is a data gap as the groundwater use term for illegal cannabis cannot be accurately calculated without further investigation of the location, areal extent, and timing of illegal cannabis production, in addition to where they are sourcing their water; this data gap that will require more data to be collected for more precise estimates of illegal cannabis production groundwater pumping. Preliminary approximate estimates of cannabis production in the basin indicated an upper limit increase of approximately 30% in agricultural pumping with a lower estimate of approximately 10% in agricultural pumping. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| California Trout | CT-006 | C | HM | Request for Clarification; see GS-003 | | 2 | 39 | 2.2.1.2 | Figure 12 | Is this the updated figure? | The figures were updated to match the previously used time span of 1984-2021 |
| California Trout | CT-007 | C | GE | Specific Edit to Plan Requested | | 2 | 63 | 2.2.1.4 | 1336 | “soil groups are described in Table (XXX)” → what table does this refer to? | The four main hydrologic soil groups were described in detail in the text thus the table is not necessary and mention of the table was removed. |
| California Trout | CT-008 | B | BR | Public Trust Doctrine, Interconnected Surface Water | | 2 | 105 | 2.2.2.6 | 2052-2054 | “the Shasta River surface water network contains many miles of stream channel that are connected to groundwater. The Shasta River and its major tributaries are all considered part of the interconnected surface water system in the Basin.” Given this statement, the GSP needs to include Public Trust considerations, as the public trust doctrine applies to the management of groundwater that impacts a public trust resource (here, the Shasta River). | See MCR "Public Trust" |
| California Trout | CT-009 | C | MN | Specific Edit to Plan Requested | | 3 | 6 | 3.3 | 134 | Per 23 C.C.R. § 354.34(b)(1-4) | Edit complete. |
| California Trout | CT-010 | C | MN | Specific Edit to Plan Requested | | 3 | 6 | 3.3 | 152 | Section 351(l) | Edit complete. |
| California Trout | CT-011 | C | MN | Data Gaps, Water Pumping | | 3 | 7 | 3.3 | 179-180 | “Owners and/or operators of groundwater wells, meeting a certain criteria, are *encouraged* to report pumping volumes” (emphasis added) → what is landowners do not want to share information? | At this time, the GSA has elected to use a voluntary program for groundwater extraction reporting. For the next five years, the GSA will conduct public outreach to encourage voluntary participation. This may be revisited in the 5-year update. |
| California Trout | CT-012 | C | MN | Monitoring Network- schedule | | 3 | 30 | 3.3.4.2 | 511 | Why will this take 10 years? | Edit complete. |
| California Trout | CT-013 | C | WQ | Groundwater Quality | | | | | 1138-1139 | “Arsenic, boron, iron, manganese, and pH do not have an SMC because they are naturally occurring.” → what if groundwater pumping increases the concentration of these constituents? | See MCR "Water Quality" |
| California Trout | CT-014 | C | PM | PMAs, Public Trust Doctrine | | 4 | | 4.1 | Table 4.1 | General thoughts about PMAs:<br>- Most of the tier 1 actions rely on another entity acting<br>- If the restriction of groundwater pumping is in Tier 3, it will likely not be implemented soon enough to improve conditions. This triggers public trust doctrine concerns. | See MCR "Public Trust" |
| California Trout | CT-015 | C | PM | PMA Implementation | | 5 | 10 | 5.1.2 | 299-337 | Concerning that the only concrete action the GSA commits to is “coordination.” What is the GSA’s strategy for implementing this GSP? | Text has been added to Chapter 5 to flesh out how the GSP will be implemented. |
| California Department of Fish and Wildlife | CDFW-001 | A | BR | GDEs, Environmental Beneficial Users, Public Trust Doctrine | | | | | | The Department has significant concerns about potential impacts of groundwater pumping on GDEs and interconnected surface waters (ISWs), including ecosystems on Department-owned and managed lands within SGMA-regulated basins. The Department owns the Shasta Valley Wildlife Area, on Little Shasta River, and Big Springs Wildlife Area within the Big Springs complex of the headwaters of Shasta River. The Department urges the GSA to plan for and engage in responsible groundwater management that minimizes or avoids these impacts to the maximum extent feasible as required under applicable provisions of SGMA and the Public Trust Doctrine. | See MCR "GDE" and "Public Trust Doctrine" |
| California Department of Fish and Wildlife | CDFW-002 | C | GD | GDE- vegetation | 23 CCR §§ 354.10(a), 354.26(b)(3), 354.28(b)(4), 354.34(b)(2), and 354.34(f)(3) | 2 | | | Table 7 | The Draft GSP species prioritized for management were identified as “riparian vegetation,” which is a vegetation type, not an ecosystem or species. | The language has been updated for clarity. |
| California Department of Fish and Wildlife | CDFW-003 | A | GD | Identification of Environmental Beneficial Users | 23 CCR §§ 354.10(a), 354.26(b)(3), 354.28(b)(4), 354.34(b)(2), and 354.34(f)(3) | 2 | | | Table 7 | While this column identified salmonids as a species prioritized for management, the Draft GSP did not provide objectives that would be anticipated to support salmonids. Instead, the GSP provided objectives intended to minimize sediment erosion into streams where bank swallows exist that depend on erosion for their management. This choice of objectives suggests that the Draft GSP does not recognize the unique life histories of these species that may give rise to differences in management needs between salmonids and other species. | See MCR "GDE" |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| California Department of Fish and Wildlife | CDFW-004 | A | BR | Identification of Environmental Beneficial Users, Endangered Species | 23 CCR §§ 354.10(a), 354.26(b)(3), 354.28(b)(4), 354.34(b)(2), and 354.34(f)(3) | | | | | In addition, many species, including special-status species, that are known to depend on or may be vulnerable to groundwater fluctuations were not identified in the first column. These include bank swallow, foothill yellow legged frog, western pond turtle, greater sandhill crane and willow flycatcher to name a few. The Draft GSP does not indicate where these species are found in the basin and how these individual species could be impacted by groundwater. | See MCR GDE |
| California Department of Fish and Wildlife | CDFW-005 | A | GD | GDE Classification Methodology | Water Code § 10727.4(l); 23 CCR § 354.16(g) | | | | | the Draft GSP does not provide sufficient detail when describing the methods used for GDE classification and mapping included in the Draft GSP and rationale for the methods used. The Draft GSP mentions tabletop methods of using existing mapping tools, root depth to groundwater modeling and other tools for identifying GDEs. However,<br>it also fails to include Advisory Committee input or field verification of the identified GDEs. Without these means of verification, the Department cannot evaluate or comment on the accuracy of the GSP's GDE classification or mapping. The Department recommends that GDE mapping is informed by science-based vegetation classification or similar methods, such as the Department's Survey of California Vegetation Classification and Mapping Standards.The Draft GSP's classification and mapping should be revised if necessary after utilizing these methods. Classification and mapping methods should be thoroughly described so that GDE classification and mapping can be verified by stakeholders or repeated during future GSP updates and effectiveness monitoring. | See MCR GDE |
| California Department of Fish and Wildlife | CDFW-006 | B | HM | Identification of Aquifers and Aquitards | 23 CCR §354.14 (b)(4)(B) and (C) | | | | | The GSP does not properly identify and characterize the principal aquifers and aquitards within the Basin as required by applicable SGMA regulations. The Draft GSP provides a regional description of the aquifer system(s) within the Basin without specifying the principal aquifer system is collectively within the basin. It would be helpful to identify the principal aquifer system within the Basin, and characterize the vertical and lateral extent of these assemblages in relation to one another. The Draft GSP should characterize associated aquifer parameters (i.e., hydraulic connectivity and specific yield/storativity) where each of the forementioned aquifer assemblages are located, and characterize or define the lateral and vertical extent of existing aquitards/confining layers within the Basin. | See MCR Aquifer System |
| California Department of Fish and Wildlife | CDFW-007 | C | HM | Accuracy of the Hydrogeologic Model | 23 CCR §354.14 (b)(3). | | | | | In addition, the Department's understanding is that the Draft GSP does not clearly identify a definable bottom of the Basin as required by applicable SGMA regulations. The Draft GSP provides a discussion of the geologic units from oldest to youngest within the Basin but does not identify a definable base between the alluvial material and deeper hard rock material in the Basin. | The HCM is appropriate and properly reflects uncertainty about the depth of the groundwater basin. Due to the volcanic nature of Shasta Valley many uncertainties surround Basin characterization. The Department of Water Resources is conducting airborne electromagnetic (AEM) surveys throughout California to assist implementing SGMA, which may improve some uncertainties in the HCM. At this time the GSP will focus on the critical data gaps listed in Appendix 3-A. Any future studies to improve the HCM will depend on partnerships with other agencies. |
| California Department of Fish and Wildlife | CDFW-008 | B | HM | Accuracy of the Hydrogeologic Model-Groundwater Elevation Countours | | | | | | The Draft GSP needs to provide groundwater level elevation contour maps depicting the groundwater table or potentiometric surface associated with current seasonal highs and seasonal lows and hydraulic gradients between principal aquifers. | See MCR Aquifer System |
| California Department of Fish and Wildlife | CDFW-009 | C | HM | Accuracy of the Hydrogeologic Model | | | | | | Different sections of the Draft GSP provide varying yields for Pluto's Cave, ranging from 1,000-4,000 gallons per minute. The Draft GSP should be consistent in its description of yields. If a range is used for this location or other springs in the Basin, it should not have a large range of variation. | The big range may stem from seasonal variations. Spring monitoring in Big Springs also exhibit a large variation in yields. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| California Department of Fish and Wildlife | CDFW-010 | C | HM | Accuracy of the Hydrogeologic Model | | | | | | In addition, the source of recharge for the springs should be identified if known. The Department suspects the source of the recharge for the springs is likely snowmelt. It would be beneficial if this could be confirmed and included in the Draft GSP. | Isotope data is being analyzed at Lawrence Livermore National Laboratory regarding the source of spring recharge. Results are expected in 2022. See MRC "General Data Gaps". |
| California Department of Fish and Wildlife | CDFW-011 | C | HM | Accuracy of the Hydrogeologic Model | | | | | | Similarly, for extractions, it would be helpful to describe the points of diversion of surface water in text and with a map, including extractions from water districts and municipalities. | We are working with the watermaster to resolve possible privacy concerns. |
| California Department of Fish and Wildlife | CDFW-012 | B | HM | Accuracy of the Hydrogeologic Model- Groundwater Elevation Contours | 23 CCR §354.16 (a)(1) | | | | | The Department was unable to locate groundwater elevation contour maps that complies with applicable SGMA regulations that require characterization of the current seasonal highs and lows of the principal aquifer within the Basin. The referenced appendices include a set of presentation slides. The Department recommends supplementing these slides with discussion of the model inputs and associated literature cited to provide a greater understanding of the model and facilitate evaluation of compliance with applicable SGMA requirements. | See MCR Aquifer System |
| California Department of Fish and Wildlife | CDFW-013 | A | GE | Meeting SGMA Requirements | 23 CCR § 354.22 et seq.; Water Code §§ 10721(x)(6) and 10727.2(b) | | | | | The Draft GSP concludes that sustainability will be achieved by 2042 and undesirable results will be avoided, but the Department has concerns about the analysis and data underlying these conclusions. The goal of sustainability cannot be achieved by 2042 without an accurate water budget and clearly-defined sustainable management criteria, including minimum thresholds and measurable objectives, | See MCR General Data Gaps |
| California Department of Fish and Wildlife | CDFW-014 | A | IS | ISW Depletion- Modeling and Minimum Threshold | 23 CCR § 354.28(c)(6) | | | | | If a numerical groundwater□surface water model is not used to quantify surface water depletion, the GSP must identify and describe an equally effective method, tool, or analytical model to be used for this purpose. The Draft GSP does not meet these requirements because it does not set minimum thresholds based on the rate or volume of surface water depletions caused by groundwater use, and it does not utilize a basin-wide groundwater-surface water model or equally effective method, tool, or model to quantify such depletions. | See MCR ISW |
| California Department of Fish and Wildlife | CDFW-015 | A | IS | ISW Depletion- SMC Calculation | 23 CCR § 354.28(c)(6) | | | | | In the Draft GSP, sustainable management criteria related to depletions of interconnected surface water have not been clearly defined. The GSP claims to have considered measured groundwater contributions and the protection of GDEs through equations and numbers identifying the minimum thresholds and measurable objectives. Based on the limited explanation and justification in the GSP, the Department does not understand how the equations and numbers will ensure adequate protection of fish and wildlife resources and habitat. These equations and general numbers do not clearly articulate how they will affect beneficial users' needs or how data gaps in the understanding of the basin have been addressed. The numbers and equations do not relate to flows needed to support species and habitat, and the equations do not appear to produce specific quantitative metrics protective of resource needs. | See MCR ISW and GDE |
| California Department of Fish and Wildlife | CDFW-016 | A | IS | ISW Depletion- SMCs | 23 CCR § 354.28(c)(6) | | | | | While interim milestones are provided, it is unclear how they will provide a "reasonable path" to achieving sustainability because they are also framed in terms of equations and percentages without relation to a specific value to ensure sustainability. | See MCR ISW |
| California Department of Fish and Wildlife | CDFW-017 | A | IS | ISW Depletion- Omission of Data | 23 CCR § 354.28(c)(6) | | | | | The Department is also concerned that the analysis omits Upper Little Shasta River and fails to account for the fact that the stream annually disconnects. | See MCR ISW |
| California Department of Fish and Wildlife | CDFW-018 | A | IS | ISW Depletion- SMCs | 23 CCR § 354.28(c)(6) | | | | | The Department requests revisions to the draft GSP to clarify how the sustainable management criteria were developed, how these criteria relate to the relevant sustainability indicators and how the criteria may affect the interests of beneficial users. | See MCR ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| California Department of Fish and Wildlife | CDFW-019 | A | IS | ISW Depletion-Accounting for Fully Allocated Stream System Designation | Water Right Order 98-08 | | | | | The Draft GSP's sustainability criteria also fail to account for the fact that the State Water Resources Control Board (SWRCB) has declared Shasta River a fully appropriated stream system (FASS) during part of the year, meaning insufficient supply is available for new water right applications at this time (Water Right Order 98-08). The FASS determination was based on numerous water rights decisions and orders that determined that allocated water likely exceeds available supplies from May 1 to October 31 each year (i.e., supplies are likely over-allocated at this time). The Draft GSP anticipates that surface water users and the Scott Valley and Shasta Valley Watermaster District (SSWD) will be able to maintain sufficient flows instream. However, given likely over-allocation and potential surface water depletions from groundwater pumping, which the GSA has not analyzed adequately, this assumption may not be realistic. | See MCR "ISW" |
| California Department of Fish and Wildlife | CDFW-020 | B | IS | ISW Depletion-Setting Thresholds | | | | | | The GSA should not wait for additional California Water Action Plan deliverables for the Shasta River before determining and implementing "sufficient flows for salmonid species within the Shasta River." The Department has provided best available science that can be used to answer this question now rather than referring to an "aspirational watershed goal." Please see the Department's previous April 28, 2020, letter for details on this best available science and the needs of other special-status species that require attention beyond salmonids. | See MCR "GDE" and "ISW" |
| California Department of Fish and Wildlife | CDFW-021 | B | WB | Water Budget-Estimating Extraction | 23 CCR § 354.18 (e) | | | | | The Draft GSP indicates no extraction information was available for wells within the Basin at the time of preparing the model. The Draft GSP does not discuss the utilization of evapotranspiration (ET) estimates to determine rates of aquifer pumping specific to crop type to quantify groundwater extraction values for development of the water budget. The Department understands that this method may be the best available science at present but suggests that the GSA consider remedying the issues regarding lack of accurate well information and groundwater usage data sets needed to adequately characterize groundwater levels and groundwater in storage within the Basin. | Thank you for this comment. As GSP implementation proceeds, the GSA intends to work to improve information about and understanding of the Basin, and plans to utilize the best available information and science to characterize groundwater conditions and usage. Over time, it is anticipated that this will include more detailed and accurate well information and groundwater usage data sets. Needs for collecting pumping data are identified in GSP Chapter 3 (Section 3.3, Lines 178-193; Appendix 3-A), and initial plans for collecting and reporting pumping data are included in GSP Chapter 4 (Section 4.2, Lines 671-687). Groundwater pumping data will be gathered and reported in GSP annual reports and periodic evaluations, as they are available.<br><br>Appendix 2-I discusses the method of satellite imagery used with potential evapotranspiration to estimate Applied Water which is used to estimate the groundwater extracted on agricultural lands. Increased groundwater level and stream monitoring is planned for the next five years to improve model representation and would benefit from groundwater extraction monitoring as well but would require additional funding to fill this data gap as extraction metering comes at a higher cost. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| California Department of Fish and Wildlife | CDFW-022 | A | HM | Hydrogeologic Model and Water Budget- Specific Yield and Irrigation Efficiency | | 2 | | | | The Department recommends revisiting the sections regarding specific yield and irrigation efficiency improvement projects to clearly identity how the SVIHM and water budget demonstrate a sustainable use of groundwater for all beneficial users. The Draft GSP needs to include a clearer explanation of the connection between groundwater that goes to surface water runoff and groundwater infiltration, or evaporation. Based on the information provided in the Draft GSP, it is difficult to understand these components of the SVIHM and water budget, the potential relationship with the surface water in GDEs, and how groundwater will impact species throughout the year. Once the GSA clarifies its understanding of these issues, the water budget should be adjusted accordingly and the Draft GSP should identify sustainable management criteria that prevent adverse impacts to beneficial users, such as dewatering of GDEs, and strive for long term groundwater sustainability with PMAs. | This comment uses an incorrect name for the Basin numerical model. It is called the Shasta Watershed Groundwater Model (SWGM). See MCR "Sustainable Yield", "Water Budgets", "ISW", and "GDE". |
| California Department of Fish and Wildlife | CDFW-023 | C | PM | PMAs- Water Conservation | | | | | | The GSA should also consider developing PMAs that promote more efficient water use through water conservation where feasible. | More efficient water use through water conservation is an innate characteristic of many PMAs such as "Irrigation Efficiency Improvements". See MCR "PMA Selection Criteria" |
| California Department of Fish and Wildlife | CDFW-024 | C | MN | Groundwater Monitoring Network- Well Identification | 23 CCR § 354.34(c)(6)(D) | 3 | | | Table 2 | Chapter 3, Table 2 identifies wells designated for potential inclusion in the groundwater level monitoring and storage monitoring network as Representative Monitoring Points (RMPs); however, the map provided for these wells does not provide any designation (well identification) for the points shown on the map. The Draft GSP should include the well ID and associated information needed to assist in the evaluation of the proposed observation point for its potential to accurately characterize groundwater occurrence at that location. As reference, the data set should include the ground surface elevations for each well, reference point elevations for water level measurements, and important well construction information (i.e., well screen perforation intervals). | Table 2 already included well identification that matched the mapped points, and characterization information including well screen intervals. The table has been updated with additional well ID numbers, which can all be referenced on CASGEM. |
| California Department of Fish and Wildlife | CDFW-025 | A | MN | Data Gaps in Model, impacts to Environmental Beneficial Users | 23 CCR § 355.4(b)(2) | | | | | The Draft GSP does not contain a basin-wide groundwater-surface water model, analysis of the surface water depletion rate, or basin-wide groundwater monitoring, all of which are necessary to assess potential surface water depletions and impacts to beneficial surface water users, including Chinook Salmon, Coho Salmon, and Pacific Lamprey. | See MCR ISW |
| California Department of Fish and Wildlife | CDFW-026 | A | IS | Instream Flows- Data Gaps | 23 CCR § 355.4(b)(2) | | | | | The GSP also lacks quantitative criteria for instream flows (discussed more fully below), which are needed to assess compliance with SGMA and avoid significant and unreasonable depletions of ISW. | See MCR "ISW" |
| California Department of Fish and Wildlife | CDFW-027 | A | GE | Compliance with SGMA- Uncertainties in Data | 23 CCR § 355.4(b)(2) | | | | | the Draft GSP must set forth a reasonable pathway and timeline for addressing these data gaps and developing sustainable management criteria as required under SGMA, supplementing with models and other data if needed to address uncertainties in basin-specific data. | See MCR General Data Gaps |
| California Department of Fish and Wildlife | CDFW-028 | B | GD | Environmental Benefical Users- Setting SMCs | 23 CCR §§ 354.24, 354.26, and 354.28 | | | | | After conducting the necessary analysis and establishing appropriate criteria, the Draft GSP should be updated to consider and avoid any unreasonable adverse impacts to beneficial users anticipated to result from such depletions. GSP characterizes instream flows as “aspirational watershed goals” within sustainable management criteria. This characterization ignores the plain language of SGMA, which clearly indicates sustainable management criteria and objectives must be developed to avoid undesirable results within the planning and implementation horizon. | See MCR "ISW" |
| California Department of Fish and Wildlife | CDFW-029 | B | HM | Omission of Data | 23 CCR § 355.4(b)(1) | | | | | the GSP lacks consideration of current versus historic surface water extractions, agriculture ditch losses and gains, new or improved wells in the basin, and local springs that feed into Shasta River. | See MCR General Data Gaps and ISW |
| California Department of Fish and Wildlife | CDFW-030 | B | HM | Omission of Data | 23 CCR § 355.4(b)(1) | | | | | the GSP fails to analyze data from Little Shasta River, a tributary of Shasta River, and may exclude smaller tributaries that regularly disconnect, including Willow and Whitney Creeks. These deficiencies in the analysis suggests the model may not be considering all relevant groundwater pumping and related impacts in the basin. | See MCR ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| California Department of Fish and Wildlife | CDFW-031 | B | MN | Monitoring Network Data Gaps | | | | | | Since SGMA requires sustainable management of the entire basin, the sustainable management criteria must take a basin-wide approach. The GSA should identify the data gaps, set basin-wide sustainable management criteria, and identify how the GSA will achieve a robust monitoring system to capture accurate information on these portions of the basin or use existing data to accurately model these portions and assess impacts. | See MCR General Data Gaps |
| California Department of Fish and Wildlife | CDFW-032 | A | PM | PMAs- Implementation Schedule | 23 CCR § 355.4(b)(5) | | | | | GSPs must include projects and management actions that are feasible and likely to prevent undesirable results and ensure that the basin is operated within its sustainable yield. The Department encourages and will make best efforts to support PMAs anticipated to address both immediate and long-term fish and wildlife resource needs. Not recognizing the role of the GSA to ensure sustainable management and deferring nearly all PMAs through an “integrative and collaborative approach” will make it difficult to achieve sustainability even by 2042 as contemplated under SGMA. The Department encourages the GSA to start working on PMAs like the reservoirs sooner than described. | Further discussion of PMA implementation has been added to Chapter 5. |
| California Department of Fish and Wildlife | CDFW-033 | A | BR | Public Trust Doctrine, GDEs | National Audubon Society v. Alpine County Superior Court (1983) 33 Cal. 3d 419, 446 | | | | | It is not clear that the GSA has undertaken the analysis and consideration required under the Public Trust Doctrine to support its proposed PMAs and management criteria. Under Audubon and Environmental Law Foundation, the GSA must conduct a robust analysis that considers the needs of public trust resources and impacts to those resources due to the proposed groundwater management practices, and that clearly explains why protection of public trust resources is infeasible due to inconsistency with the public interest. As explained above, the GSA has yet to resolve significant data gaps relevant to the surface water depletion rate, basin-wide groundwater levels, and the presence and needs of GDEs and beneficial users of interconnected surface waters. These issues must be addressed to ensure appropriate consideration of the needs of public trust resources as required under the Public Trust Doctrine. | See MCR "Public Trust", "ISW", "GDE", "General Data Gaps" |
| California Department of Fish and Wildlife | CDFW-034 | B | PM | PMAs- Selecting PMAs in light of Public Trust | | | | | | Based on an accurate understanding of public trust resource needs and impacts, the GSA will need to assess a range of potential protective measures to address impacts of groundwater extractions. These measures may need to go beyond the PMAs identified in the Draft GSP and may include pumping limits or alternative supply options to address existing, new, and expanded extractions. Given overallocation and ongoing drought, it is critical to plan for such eventualities in the Draft GSP. Before rejecting such measures, the GSA will need to engage in a balancing of competing interests that shows that protecting species and habitat though contingent pumping limits, use of supply alternatives, or equivalent protective measures would be infeasible. | See MCR "Public Trust" |
| California Department of Fish and Wildlife | CDFW-035 | A | BR | PMAs- Impact on Endangered Species | | | | | | the GSA should consider the implications of its GSP development and implementation on species listed under the California Endangered Species Act (CESA). As previously identified in our April 28, 2020 letter, the highest priority recovery actions for protection of CESA threatened Coho Salmon include increasing instream flows, increasing cold water input in the Upper Shasta basin, reducing overall water temperature, increasing dissolved oxygen, and reducing warm tailwater inputs to the stream. The current Draft GSP does not support all beneficial users including aquatic species like salmonids by not accounting for their needs in the sustainable management criteria and deferring the PMAs to a future date. | See MCR "Public Trust" |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| California Department of Fish and Wildlife | CDFW-036 | B | GD | Environmental Beneficial Users- Modeling | | | | | | the North Coast Regional Water Quality Control Board (Regional Water Board) provided a recommendation for an increase of 45 cubic feet per second (CFS) of cold water from the Big Springs Complex into the Shasta River. (Regional Water Board, 2006. Staff Report for the Action Plan for the Shasta River Watershed Temperature and Dissolved Oxygen Total Maximum Daily Loads. Chapter 6. Temperature TMDL.) According to their modeling analysis, this cold water is the most beneficial flow contribution in the Shasta River with respect to temperature and is critical for temperature TMDL compliance and support of the most sensitive beneficial uses the Regional Water Board identified in their analysis, which include cold freshwater habitat and spawning, reproduction, and/or early development of aquatic species. The Total Maximum Daily Load (TMDL) analysis provides clear evidence that these beneficial uses depend on supporting conditions provided by the recommended increase in cold groundwater, which in turn supports groundwater dependent ecosystems. These ecosystems may be currently threatened by unsustainable groundwater use. | See MCR "ISW" |
| California Department of Fish and Wildlife | CDFW-037 | B | GD | Environmental Beneficial Users- Public Trust Doctrine | | | | | | the Temperature TMDL assigns load allocations for riparian shade and riparian areas are inherently groundwater dependent ecosystems. Actions may need to go beyond SGMA minimum requirements to meet Public Trust Doctrine requirements. | See MCR "Public Trust Doctrine" |
| California Department of Fish and Wildlife | CDFW-038 | A | BR | PMA Schedule in light of Public Trust and ESA | | | | | | The GSA has also suggested that it will defer PMAs for protection of Public Trust resources and CESA-listed species. Delaying these actions is not likely to ensure protection of public trust resources, particularly since ongoing groundwater pumping is causing significant adverse impacts to those resources. The GSA's proposal to spend the next 5 years increasing monitoring and fleshing out the outstanding sections of the GSP unduly delays tangible actions needed in the immediate term for protection of public trust resources. | See MCR "Public Trust Doctrine" |
| California Department of Fish and Wildlife | CDFW-039 | A | BR | State Water Board Emergency Regs | 23 CCR § 354.28(b)(5), 8/17/2021 SWRCB Emergency Regs | | | | | Per SGMA regulations, GSP minimum thresholds must be consistent with existing regulatory standards absent clear justification for differences. Emergency regulations approved by SWRCB on August 17, 2021, and effective on August 30, 2021, set forth minimum instream flows needed to avoid extirpation of certain fish species in the Scott and Shasta rivers during the current drought emergency. Per the SWRCB's Informative Digest, these emergency regulations are intended to preserve minimum instream flows for migration, rearing, and spawning of fall-run Chinook and SONCC coho salmon in the Scott and Shasta rivers during the current drought emergency. (pp. 21-22.) These regulations must be accounted for in the draft GSPs for the Scott and Shasta basins. | See MCR "Emergency Regulations" |
| California Department of Fish and Wildlife | CDFW-040 | A | BR | Public Trust Doctrine- Instream Flows | 8/17/2021 SWRCB Emergency Regs | | | | | The Public Trust Doctrine requires the GSA to manage groundwater pumping in the basin to ensure instream flows in interconnected surface waters (e.g., the Scott and Shasta rivers) are maintained at levels that fully support all life stages of all fish species during all seasons and water year types when feasible. In certain seasons and water year types, this may require maintenance of additional flow beyond the minimum instream flows set forth in the SWRCB emergency regulations. | See MCR "Emergency Regulations" |
| Scott Valley and Shasta Valley Watermaster District | SSWD-001 | C | WR | Specific Edit to Plan Requested: Water Resources | | 2 | 14 | 2.1.2.2 | Line 233 | Recommend: Amend to specify that "during dry seasons, groundwater springs in the Big Springs Complex provide an estimated 95 percent of baseflow to the lower Shasta River via the Big Springs Creek tributary" (Nichols et al, 2010). | Edit Complete. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-002 | C | SB | Specific Edit to Plan Requested | | 2 | 19-20 | 2.1.2.12 | 449 | Recommend: list BSID and MWCD separately, to identify them as the only irrigation districts that divert groundwater.<br>Comment: If the descriptions of SWRA and GID are to remain in the plan, need to make clear that these are adjudicated surface water users that are not subject to SGMA. | Edit Complete. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Valley and Shasta Valley Watermaster District | SSWD-003 | C | WR | Specific Edit to Plan Requested: Water Rights | | 2 | 20 | 2.1.2.12 | 450 | Correction Needed: BSID abandoned 25 of 30 cfs priority 24 from Big Springs Lake in a letter dated 6/18/1987 to DWR. BSID then abandoned the remaining 5cfs in a letter dated 12/17/1996 to DWR. Therefore, BSID has no active water rights from Big Springs Lake. | Edit Complete. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-004 | C | WR | Specific Edit to Plan Requested | | 2 | 20 | 2.1.2.12 | 451 | Question: what entity will manage BSID's groundwater diversion? | Groundwater diversions are under the GSA's jurisdiction. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-005 | C | WR | Specific Edit to Plan Requested | | 2 | 20 | 2.1.2.12 | 454 | Correction needed: Please clarify that BSID does not divert surface water. Is the "surface water management" described here referring to their delivery system? | Edit Complete. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-006 | C | WR | Specific Edit to Plan Requested: Water Rights | | 2 | 20 | 2.1.2.12 | 456-462 | Correction needed: Please clarify that GID has surface water rights via the Shasta River Decree that are not subject to SGMA. Question: how/why will GID surface water management be incorporated into the GSP? | Edit Complete. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-007 | C | WR | Specific Edit to Plan Requested: Water Rights | | 2 | 20 | 2.1.2.12 | 472-476 | Correction needed: Please clarify that SWRA has surface water rights via the Shasta River Decree that are not subject to SGMA. Question: how/why will SWRA surface water management be incorporated into the GSP? | Edit Complete. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-008 | C | GE | Specific Edit to Plan Requested | | 2 | 23 | 2.1.2.16 | 519-530 | Comment: Thank you for editing this section from the previous draft. Lines 519-530 are now largely duplicative to lines 531-566, and could be deleted. | Text was updated to reduce duplication. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-009 | C | WR | Specific Edit to Plan Requested | | 2 | 24 | 2.1.2.16 | 567-568 | Comment: SSWD may be prohibited from providing this level of diversion detail due to privacy regulations. However, we can consult with legal counsel as to what type of aggregate data we could provide. | Noted. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-010 | C | WR | Specific Edit to Plan Requested | | 2 | 78 | 2.2.1.5 | 1466-1468 | Comment: This statement is not accurate. Please provide supporting documentation for the Willis source. | Removed sentence and provided documentation of the Willis source in the reference section. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-011 | C | WR | Specific Edit to Plan Requested: Water Resources | | 2 | 107 | 2.2.2.6 | 2087 | Recommend: Since Big Springs accounts for 95% of lower Shasta River baseflow during the irrigation season, please pursue research to address this data gap first, rather than the current research focus along the Little Shasta River. | The GSP has been updated to address this comment. See MCR "ISW". |
| Scott Valley and Shasta Valley Watermaster District | SSWD-012 | C | IS | Specific Edit to Plan Requested: Water Resources | | 2 | 116 | 2.2.2.6 | 2209 | Correction needed: No surface irrigation diversions were occurring at the time of this study. Please edit this sentence to reflect this fact. | Edit Complete. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-013 | C | MN | Monitoring Networks- ISW Data | Water Code § 10721(x)(1)- 93 (6) | 3 | 6 | 3.3 | All | Comment: SSWD can assist in collecting data that will inform the "Depletions of Interconnected Surface Water (ISW)" component of the GSP. SSWD has a particular interest in addressing the SGMA undesirable result of "depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water" | Noted. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-014 | B | MN | Monitoring Network- ISW Data | | 3 | 14-17 | 3.3 | Table 1 | Recommend: Highly recommend adding ISW monitoring sites near known groundwater pumping locations. | See MCR ISW |
| Scott Valley and Shasta Valley Watermaster District | SSWD-015 | B | IS | ISW System Data | | 3 | 26 | 3.3.4.1 | 436 | STRONGLY RECOMMEND: Need to evaluate groundwater contributions to the Shasta River year-round, or at least before, during, and after irrigation season. | See MCR ISW |
| Scott Valley and Shasta Valley Watermaster District | SSWD-016 | C | IS | ISW Depletion | | 3 | 29 | 3.3.4.1 | 474 | Recommend: SPU gage has value as indicator of surface water depletions, particularly immediately before and after the majority of groundwater pumps turn on in the spring. | SPU gage will be included in the planned expansion of the ISW monitoring network. See Section 3.3.4.2. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Valley and Shasta Valley Watermaster District | SSWD-017 | C | IS | ISW Depletion: Monitoring Network | | 3 | 30 | 3.3.4.2 | 504 | Recommend: SPU is currently maintained by DWR and has been since 2013. Please include the data from this gage. | The SPU gage will be included in the future monitoring network, in the proposed expansion discussed in Section 3.3.4.2. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-018 | C | IS | ISW Depletion: Monitoring Network Schedule | | 3 | 31 | 3.3.4.3 | 513 | Recommend: Monitoring needs to occur prior to groundwater pumps turning on in the spring, in order to capture data to help determine how much groundwater pumping is depleting surface flows in the lower Shasta River. | Edit complete. Monitoring will occur through the entire year. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-019 | C | IS | ISW Depletion: Monitoring Network Schedule | | 3 | 31 | 3.3.4.3 | 522 | Recommend: If groundwater level sampling only occurs twice per year, it should be done pre and post irrigation season. | Edit complete. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-020 | C | IS | Request for Clarification: ISW Depletion | | 3 | 42 | 3.4.3.2 | 791 | Question: What are the identified reaches for ISW? Again, any useful ISW measurements need to be taken prior to, during, and after irrigation season. | For the current iteration of the ISW SMCs, the only reach for which we can define baseflow is part of the main Shasta River. The goal for the 5-year GSP update is to fill data gaps and upgrade the Shasta Watershed Groundwater Model (SWGM) to examine the entire ISW network (see ISW map in Section 2.2.2.6) to define surface water depletion due to groundwater pumping. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-021 | B | IS | ISW Depletion: Minimum Threshold | | 3 | 42 | 3.4.3.2 | 807-812 | Comment: Computing baseflows at SRM using this formula for gaging minimum thresholds during the irrigation season on a real-time basis can be very cumbersome and inaccurate due to all the variables involved including the large number of adjudicated and riparian surface water diversions between Dwinnell Reservoir and SRM, unknown surface and subsurface return flows from irrigation as well as the large flow travel time between these two sites which is estimated at about 18 hours at lower flows. For this method to be reliable, the flow at the upstream and downstream gages and the surface water and ground water diversions would have to be in a steady state at least 18 hours before the measurements as well as during the measurements. The watermaster would also need permission from the riparian diverters to measure their diversions along with the adjudicated diversions within a given day. Even so, this method does not account for the depletion of surface water due to ground water diversions.<br><br>Given all the variables involved, SSWD recommends that minimum thresholds be determined for SPU and real-time baseflows be computed using the SPU gage instead of SRM. When baseflows are approaching minimum thresholds, only a few surface water diversions will be occurring between Dwinnell Reservoir and SPU, no riparian diversions exist, the flow travel time is only about 6 hours and as the available flow data for SPU indicates, the baseflow at this gage equals near 100% of the inflow to the Lower Shasta during low flow periods and the actual flow at this gage would be close to the baseflow. | See MCR ISW |
| Scott Valley and Shasta Valley Watermaster District | SSWD-022 | C | IS | Specific Edit to Plan Requested: ISW Data | | 3 | 43 | 3.4.3.2 | Table 7 | Correction needed: The SRM mean daily flow values for 2016 and 2017 in Table 7 do not agree with the USGS final data. These values should be 40.6, 48.8, 65.6, 67.4, 71.4 and 75.0 cfs, respectively. The flow values for 2018 – 2020 agree with the final data. Also, it appears that the terms “Baseflow” and “Groundwater Contributions” as used in Table 7 and Figure 10 are the same values, but this is confusing. | The values given by the reviewer match the data found on the USGS website for mean daily flow for SRM, Table 7 and the associated calculations have been updated to reflect this. The GSP text was updated to only use the term Groundwater Contributions as it was more prevasive in the text. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-023 | A | IS | ISW Depletion: Minimum Threshold | | 3 | 45 | 3.4.3.4 | Table 8 | Recommend: SSWD recommends that the preliminary minimum threshold for baseflow be set at 115 cfs instead of 100 cfs and a trigger be set at 130 cfs instead of 115 cfs at SRM and that these values do not change depending on the year type. | See MCR ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Scott Valley and Shasta Valley Watermaster District | SSWD-024 | A | IS | ISW Depletion: Minimum Threshold | | 3 | 45 | 3.4.3.3 | 849 | Recommend: using 115 as the minimum threshold. This is consistent with the recent SWB Emergency Drought Regulation. If the SGMA process doesn't address drought conditions, the SWB likely will.<br>Note: The recent SWB Emergency Drought Regulation included a schedule of water right priorities for both surface water and groundwater users. It would behoove the SGMA Team to include this in the GSP. | See MCR ISW |
| Scott Valley and Shasta Valley Watermaster District | SSWD-025 | C | MN | Specific Edit to Plan Requested: Monitoring Network | | 3 | 47 | 3.4.3.6 | 932 | Recommend: CDFW will be installing a stream gage in Big Springs Creek, which is a major ISW area. Recommend including this gage into the monitoring network to provide real-time continuous flow data. | The stream gage in Big Springs Creek will be included in the future monitoring network, in the proposed expansion discussed in Section 3.3.4.2. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-026 | C | PM | Specific Edit to Plan Requested: PMAs | | 4 | 6 | 4.1 | Table 4.1 | Correction needed: on Watermaster Tier 1: Please add first sentence: "Implements Shasta River Decree." Then, please replace "enforce" with "assists in managing." | Edit Complete |
| Scott Valley and Shasta Valley Watermaster District | SSWD-027 | B | PM | PMAs | | 4 | 10 | 4.1 | Table 4.1 | Recommend: adding Tier 3 project titled "Coordinated Shasta Valley Irrigation Management," as a voluntary locally-led initiative amongst all water users to rotate diversions and employ other tools to keep more water instream and avoid additional regulations. Potentially led by SSWD or RCD. | PMA added to Chapter 4. |
| Scott Valley and Shasta Valley Watermaster District | SSWD-028 | A | PM | PMAs: Permitting | | 4 | 11 | 4.2 | 304 | Recommend: For new well permits, add a restriction of how close to surface water the well can be placed, based on modeling of if surface water will be depleted by well pumping. | See MCR "5-year Update" |
| Scott Valley and Shasta Valley Watermaster District | SSWD-029 | A | PM | PMAs: Permitting | | 4 | 19 | 4.2 | 501 | Same recommendation as above. | See MCR "5-year Update" |
| David Webb for Friends of the Shasta River | FOSR-001 | C | OR | Draft GSP Public Comment Period | | | | | | We would like to have it noted that we are filing under protest, in that the entire document has not been available for the entire 45 days, and that some of it is still not available, hence we were not able to review either all that has been posted, nor the entire document since some is not posted at all. At eh same time, we do recognize that DWR seems to not be willing to allow additional time for completion and proper review. | Noted |
| David Webb for Friends of the Shasta River | FOSR-002 | C | SB | Specific Edit to Plan Reqeusted: Land Use | | 2 | 8 | | 1 | The numbers appear to be for the entire watershed. They should be subsetted out for the management area only. | Comment noted and numbers are being reviewed. |
| David Webb for Friends of the Shasta River | FOSR-003 | C | SB | Specific Edit to Plan Reqeusted: Land Use | | 2 | 9 | | 3 | Unclear what the X and Y axes are. There should be a link to an electronic version that can be downloaded and viewed at such a scale as to be meaningful | See MCR "Data System". The axis are latitude and longitude in the projection NAD 83 / California Albers (EPSG:3310). |
| David Webb for Friends of the Shasta River | FOSR-004 | C | WR | Specific Edit to Plan Reqeusted: Water Rights | | 2 | 20 | | 450-4 | Check with Lisa Faris, but I think BSID has formally abandoned its right to Big Springs as a water source | Edit Complete. |
| David Webb for Friends of the Shasta River | FOSR-005 | C | WR | Specific Edit to Plan Reqeusted: Water Rights | | 2 | 20 | | 466 | MWCD has a storage right to 35,000 af from the Shasta and ~14,000 af from Parks Creek, with no restriction on flow from the Shasta, and 150 cfs max from Parks Creek. And you should be more explicit about their gw usage since it has already been the target of an interference lawsuit. They pump gw from both the Pacy Wells and the Flying L pumps, and until the last few years their canal leaked to groundwater 20-30 cfs constantly when running full, which is now gone as a result of public funding for canal lining. Also MWCD has blocked public access to any of the data from the gauges below the dam, so they may not be worth mentioning. | Comment noted and numbers are being reviewed. |
| David Webb for Friends of the Shasta River | FOSR-006 | C | WR | Specific Edit to Plan Reqeusted: Water Resources | | 2 | 22 | | 494 | I don't think the SVRCD has had funding for operation of the Yreka Creek gauge for some years. Better check. | Maintenance of stream gages will be included in implementation projects. |
| David Webb for Friends of the Shasta River | FOSR-007 | C | WR | Specific Edit to Plan Reqeusted: Water Resources | | 2 | 23-4 | | 519-68 | This contains internal inconsistencies and errors, is overly long. Needs to be completely rewritten | This section was rewritten to correct restatements, it was originally edited with suggestions form the Shasta Valley Watermaster. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-008 | C | SB | Specific Edit to Plan Reqeusted: Basin Setting | | 2 | 26 | | 637-45 | 2014 data should be updated from current county records. Additionally, note should be made that the reduced property tax income to the county has not been offset by state subvention funds since 2009. | Noted. |
| David Webb for Friends of the Shasta River | FOSR-009 | C | WI | Specific Edit to Plan Reqeusted: Permitting | | 2 | | | 650-658 | This sections should include information on the impacts of the recently lost lawsuit where the county is now required to do CEQA analysis on new well permits, providing a basis for future gw demand management. | Noted. |
| David Webb for Friends of the Shasta River | FOSR-010 | B | WR | Specific Edit to Plan Reqeusted: Water Resources | | 2 | 27-28 | | 660-701 | This illegal use needs to be put into perspective, with the range of water usage estimates converted to estimated acre feet, with comparison to other agricultural uses of groundwater in the Shasta Valley. The county is already under fire for claimed racist treatment of illegal growers. Not adding this perspective adds to that issue. | Water usage by the illegal cannabis community within Shasta Valley unknown. Agricultural usage of groundwater is also uncertain due to the lack of well metering. Voluntary reporting of groundwater extraction to the GSA (see PMA in Chapter 4) is the best path towards comparing groundwater usage by legal and illegal growers. |
| David Webb for Friends of the Shasta River | FOSR-011 | C | SB | Specific Edit to Plan Reqeusted: Basin Setting | | 2 | 28 | | 712-19 | This could be a whole lot clearer. Rewrite please | Legal language must remain unchanged. No edit completed. |
| David Webb for Friends of the Shasta River | FOSR-012 | C | WR | Specific Edit to Plan Reqeusted: Water Resources | | 2 | 29 | | 726-7 | This ignores the de facto replenishment from the extensive network of irrigation ditches. And it should be noted that public funding is steadily reducing that recharge through payments for pipelines and canal lining, both of which need to be factored into availability calculations going forwards from baseline years. | Recharge from irrigation ditches are discussed elsewhere in the GSP. See MCR "ISW". |
| David Webb for Friends of the Shasta River | FOSR-013 | C | WR | Specific Edit to Plan Reqeusted: Water Resources | | 2 | 30 | | 738-69 | You really should mention the lahar forming the bulk of the flat portion of the Shasta Valley, and much of the gw basin, and which is responsible for forcing water in Pluto's cave basalt to surface as springs. | The existing chapter presents the known geology of Shasta Valley and the basis of the Shasta Watershed Groundwater Model (SWGM). See MCR "HCM". |
| David Webb for Friends of the Shasta River | FOSR-014 | C | WR | Specific Edit to Plan Reqeusted: Water Resources | | 2 | 35 | | Fig 8 | Text of caption does not quite match illustration | The figure will be updated in the GSP to reflect the text as the period of historical interest is 1983-2020 as it relates to the model. |
| David Webb for Friends of the Shasta River | FOSR-015 | C | WR | Specific Edit to Plan Reqeusted: Water Resources | | 2 | 43-4 | | 814- | Completely ignoring the lahar filling the Shasta Valley presents a very outmoded interpretation of surficial geology. See USGS Bulletin 1861 | The existing chapter presents the known geology of Shasta Valley and the basis of the Shasta Watershed Groundwater Model (SWGM). See MCR "HCM". |
| David Webb for Friends of the Shasta River | FOSR-016 | C | WR | Specific Edit to Plan Reqeusted: Water Resources | | 2 | 44 | | 819-21 | It should be clearly noted that the Hornbrook formation does not yield potable or agriculturally useful water and serves as the lower extent of usable aquifer space | This is addressed elsewhere in the GSP. |
| David Webb for Friends of the Shasta River | FOSR-017 | C | WR | Specific Edit to Plan Reqeusted: Water Resources | | 2 | 48-9 | | 975-980 | This needs to be re-written so as to be meaningful to the ordinary reader | The text was updated to use more common language and include examples of the geologic description. |
| David Webb for Friends of the Shasta River | FOSR-018 | C | GE | Specific Edit to Plan Reqeusted: Basin Setting | | 2 | 78 | | 1480 | Range of data years not correct. | The data availability periods were updated according to the USGS website of 1911-2021 and 1933-2021 for SRM and SRY respectively. |
| David Webb for Friends of the Shasta River | FOSR-019 | C | GL | Groundwater Levels | | 2 | 85 | | 1586-94 | For proper understanding, merely saying gw levels are stable doesn't impart the most important pieces of the picture. More accurate would be to say something along the lines that overall, full recharge occurs by the spring of each year, but because measurement are taken only spring and fall nothing is known about the timing or maximum depth of summer drawdown as it may be changing over time. | Edit complete. |
| David Webb for Friends of the Shasta River | FOSR-020 | C | GD | Groundwater Level Impact to GDEs | | 2 | 86 | | 1615-6 | It is also important for domestic uses which must be noted here. Additionally, the importance for fish should be further highlighted with the need for gw levels to be sufficiently high to sustain cold gw discharges in the stream bed and from springs feeding the river. Without that discharge no cold water fish habitat will survive, and its maintenance will necessarily serve to guide future gw management | Edit complete. |
| David Webb for Friends of the Shasta River | FOSR-021 | C | GS | Specific Edit to Plan Requested: Groundwater Storage | | 2 | 86 | | 1621-2 | Reference is made to section 2.3, which doesn't seem to exist. Why not go into gw storage here along with the following maps, rather than making a reader jump around? | Section 2.2.1 is presenting the scientific basis of the hydrogeologic model and an overall storage estimate has not been done for the Shasta Valley groundwater basin. Section 2.2.3 presents the results of the Shasta Watershed Groundwater Model (SWGM), which estimates the storage. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-022 | C | GL | Specific Edit to Plan Requested: Mapping | | 2 | 87-91 | | figs | These figs would be improved if you added the east-west roads--HY 3, A-12, Louie Rd and Jackson Ranch Road. | No action as adding roads would make reading the contour lines more difficult. |
| David Webb for Friends of the Shasta River | FOSR-023 | C | GL | Specific Edit to Plan Requested: Mapping | | 2 | 87 | | Fig 35 | Elevations throughout should be converted to MSL also with a 2nd map set to show that, since surface elevation is highly variable, hence depth to water is largely meaningless, especially without surface elevation.. | Depth to water is meaningful for discussions of GDEs and ISWs. A map with MSL has been added. |
| David Webb for Friends of the Shasta River | FOSR-024 | B | WQ | Groundwater Quality | | 2 | 93 | | 1627 ff | Mention in this background section needs to be made of the absolutely crucial role gw discharge to surface water plays on surface water quality in terms of temperature, and while gw temperature isn't going to change, reduction in gw discharge will/has negatively impacted surface water quality and placed an possibly insurmountable burden on surface water users in terms of meeting TMDL goals without integrating gw depletion into TMDL targeted efforts. | See MCR "Surface Water Temperature" |
| David Webb for Friends of the Shasta River | FOSR-025 | B | WQ | Groundwater Quality | | 2 | 94 ff | | 1668 ff | You fail to provide any insight into the marked degradation in water quality resulting from extraction from the Hornbrook formation vs. overlying sediments. That degradation effectively makes the Hornbrook unsuitable for any current uses and limits water availability in the basin to those sediments overlying it only. | See MCR "References" |
| David Webb for Friends of the Shasta River | FOSR-026 | A | WQ | Groundwater Quality Monitoring Networks | | 2 | 94 | | 1675-77 | In this section it is not clear, but it appears that what may have been done is approach the contamination question backwards--taking existing wells and using them as the basis for a monitoring plan. A proper approach would be to first determine what areas and constituents needed to be monitored, then looking to see if any existing wells were located where needed. If so, their usage would be appropriate Limiting investigations to only existing wells is completely faulty and needs to be done properly. | Development of the monitoring network was based on:<br>- the list of consitutents of concern developed in Chapter 2.2.2.3 and Appendix 2-B<br>- wells within the Basin with historical data and reliable monitoring programs. |
| David Webb for Friends of the Shasta River | FOSR-027 | C | GE | Specific Edit to Plan Requested | | 2 | 95 | | 1718 | Refers to Appendix 2-b, which is the correct title as posted, but the document itself is called Appendix C in the headers and title sheet. | The title and headers in Appendix 2-B will be updated to reflect that it is in Appendix 2-B |
| David Webb for Friends of the Shasta River | FOSR-028 | B | IS | Identification of ISW Systems | | 2 | 105 | | 2055-59 | Surface diversion has an arguably greater impact on flow most of the year than any of the natural factors except winter floods. As such, to keep flow variation in perspective, irrigation diversion absolutely must be pointed out here as taking 90% or more of the total natural flow at times in nearly all summers, overwhelming other factors. | The GSP states that the Shasta River system has the five functional flow elements and not that they control the flow, precipitation and runoff significantly control streamflow but they are not explicitly stated here rather they are discussed in Section 2.2.1.5 Hydrology along with surface diversions. This section is on Interconnected Surface Water looks at the influence of groundwater conditions on streamflow thus it mentions Big Springs as a groundwater influence. |
| David Webb for Friends of the Shasta River | FOSR-029 | B | IS | Identification of ISW Systems: Transects | | 2 | 108 | | 2095-8 | Data was presented to the consultants by representatives of the water master district strongly indicating that in 2020 considerable losses of surface water to groundwater was occurring between the CDEC gauges SPU and SRM. While not part of any planned study, the implications and magnitude are too great not to be mentioned here. Also important is that the apparent placement of the SRU transect near the apparent confluence of Julien Creek may have inadvertently left it influenced by stream underflow from Julien creek and its near-stream associated springs to the west of the Montague Grenada Road. As such, its findings should be clearly explained as not necessarily representative of any other portion of the river, and the data from between SPU and SRM should be included here to offset any misperceptions. | See MCR "ISW" |
| David Webb for Friends of the Shasta River | FOSR-030 | C | IS | Identification of ISW Systems: Transects | | 2 | 110 | | Fig 46 | Need a more detailed location of transects please. | See updated map in Chapter 3. Exact locations are kept private within the GSA due to agreements with participating landowners. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-031 | B | GD | Identification of GDEs | | 2 | 120 ff, 126, | 2.2.2.7 | 2230, 2331-3 | The GDE screening use of DWR's identified irrigated areas in an effort to exclude man-made wet areas yields faulty results in that (in the words of UC Extension agent Dan Drake describing one such area in particular) there are irrigated areas of natural wetland which he described as " an irrigated swamp". That situation of rising groundwater creating small to large wetlands is relatively common in the Shasta Valley with its confused surface and subsurface geology, and the impossibility of fine-tuning flood irrigation to not irrigate such wet areas if the surrounding areas below the ditches need irrigation. Failing to identify and capture the seeps, springs, and wetlands effectively eliminates many early-warnings of declining groundwater, and will ultimately result in decreased surface flows. Many such areas are also irrigated, or surrounded by irrigated lands, making them impossible to identify by DWR. There needs to be further study, perhaps along the lines of performing remote sensing of leaf moisture content in the Fall of the year well after irrigation has ceased to identify areas with leaf moisture levels higher than surrounding areas, regardless of whether irrigation ditches are present near-by or not. Large areas meeting this description can be found south of the Parks Creek crossing of HY 99 and north of the Edgewood Exit , north of the Hy 3 crossing of the Shasta River, South of the Montague-Grenada Road Crossing, and along a broad swath of the little Shasta west of Harry Cash Road and East of Montague, and elsewhere. In addition, the tiny maps in the document do not allow review of any specific areas for inclusion or exclusion and are useless eye candy. GIS data needs to be posted and accessible and also detailed PDF maps so the general public can draw proper conclusions. | See MCR GDE |
| David Webb for Friends of the Shasta River | FOSR-032 | B | GD | Identification of GDEs: Depth to Groundwater | | 2 | 130 ff | | 2394-2400 | This appears to be saying that an acceptable depth to gw will be at the extreme end of the maximum depth of willow rooting, or even beyond. That provides no margin of error for climatic fluctuations, and ignores the necessity of water reaching the surface in order to allow seedling propagation. If this is correct, it is not at all conservative and needs to be reduced to some mid depth value for dry years, and near surface for wet years. The same applies further on for other gw dependent species also. If this is incorrect, the topic needs additional clarification please. | See MCR GDE |
| David Webb for Friends of the Shasta River | FOSR-033 | B | GD | Identification of GDEs: Depth to Groundwater | | 2 | 133-3 | | 2412-2433, fig 58 | Given the unique geology of much of the Shasta Valley, there needs to be some sort of validation that "*These grid or raster geospatial datasets were developed 2428 by interpolating between statistical representations of observed groundwater elevations for each three-year rolling period using data obtained from the California Statewide Groundwater Elevation Monitoring (CASGEM) Program using the well-establish kriging method*" can in fact be accurately used to interpolate between known points. Common methods won't always work in uncommon situations, and there is no discussion/documentation of their applicability in an area dominated by the largest volcanic lahar on the planet and with large areas of volcanic deposits which collectively funnel groundwater to the surface or restrict it below the surface in ways not consistent with conditions found in purely alluvial areas. See also lines 2679-82 in Chapter 2 confirming this complexity. Finally, depth to gw seems to be a relatively useless metric in an area of highly varying surface elevation, again as different from typically fully alluvial areas. All gw data should be also presented in height relative to mean sea level. | Noted. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-034 | B | GD | Identification of GDEs: Depth to Groundwater | | 2 | 135 | | 2434-2437 | The processes described seem reasonable, assuming the data is accurate, but in fact it necessarily relies on multiple layers of approximations. As far as I know, elevation for most of the Shasta Valley is only available as 30 m digital elevation models (DEMs), making comparisons of measured depth to gw at one well location impossible to compare to depth to water at another potential GDE location, since the electronic surface elevations are not nearly sufficiently accurate at the elevations involved. As with the rest of the document, there isn't sufficient time to adequately research this other than to bring it up as an apparent problem. While the normal accuracy of 30 M DEM's is stated as "3.04 meters." It is followed by the following caveat "It is important to note that the vertical accuracy actually varies significantly across the U.S". Given the target depth for willow roots of 13', or 4 meters, there is ample room for mis-classification of all species. | Noted. |
| David Webb for Friends of the Shasta River | FOSR-035 | C | GD | Identification of GDEs | | 2 | 136 | | 2504-09 | This paragraph claims the analysis (described in our prior comment above) describes "the maximum possible extent" of vegetated GDEs. As stated above, surface elevation data appears to be inadequate to support the analysis used, and hence the conclusion stated. It goes on to note that it is not a definitive determination, but the plan includes no sub sample analysis type project proposal to validate its accuracy, and instead will leave unknown acres unprotected. | The GSA acknowledges the data gaps in the GDE analysis in Section 2.2.2.7 and outlines how to address them in Appendix 3-A and Chapter 5. Additional text has been added to Section 2.2.2.7 and Appendix 3-A for clarity and an additional management action "Groundwater Dependent Ecosystem Data Gaps" has been added to Chapter 4. The GSA looks forward to working with CDFW and other agencies to fill these data gaps of local habitat in Shasta Valley in the next 5 years for the next GSP update. |
| David Webb for Friends of the Shasta River | FOSR-036 | A | WB | Accuracy of Water Budget | | 2 | 138-9 | | 2513-4, fig 60 and 61 | Sufficient data is not provided in appendix 2E as here stated. We have asked for numeric data used to produce the two figures, and the sources of that data and have received no response as of 9/26. This appears to be the validation period for the model, and a cursory look suggests multiple problems with the data assumptions built into the figures. Those problems cannot be evaluated without the above information. Included are: A static leakage value from canals despite ongoing canal lining, seemingly static lake leakage into gw, despite variable lake elevations and consequent leakage, increasing gw leakage into streams over time, despite expanding gw usage, and apparently unrelated to water year type, and no change in streams leaking into gw, despite presentation of data suggesting just that in the course of plan development.. | See MCR Water Budgets |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-037 | A | WB | Accuracy of Water Budget | | 2 | 143-5 | 2.2.3.2, 2.2.3.3 | Tables 13-18, 2637-2656 | Collectively these pages and lines describe values used in depicting annual water budgets for a ~20 year period from 1991-2018. No source of the data values sued is provided. No explanation is given for how the values are prorated for the various water years, The absence of this sources and methods information makes proper review and commenting on all terms impossible. Other published data strongly suggests significant inaccuracies exist in the numbers used. This information was presumably used to calibrate and validate the model outputs. If so, the model itself needs to be re-configured: As an example, Appendix 2-B page 23 includes a map of the longer leaky ditches within the watershed. Looking at just one of those explicitly identified ditches--the Montague Water Conservation District Main Canal--A study by Willis and Deas in 2010 for the Montague Water Conservation District (District) determined that the canal lost 28 cfs on a continuous basis when running at capacity. That quantity over a 180 day irrigation season equates to 10.1 TAF. In table 13 and 14, the maximum value for canal leakage to gw for the entire GW basin and watershed both is listed as 10 TAF, less than the measured leakage from this one ditch alone, let along all the other major and minor ditches throughout the watershed. To offset this error, some other factor(s) must be proportionally smaller than what is real, and a model built to target those inaccurate numbers will necessarily predict poorly. The other values shown are not so easily disputed in the absence of more source information, but would seem to be equally suspect. This error is compounded by the District's ongoing efforts to eliminate that leakage, and they currently have ~ $4 million in public grant funds to complete the lining of the canal, with an obvious impact on gw supply. Nowhere does the model make mention of subtracting an appropriate amount of recharge to compensate for this loss. Instead it calls for spending more public money to duplicate the effect of leaky ditches with MAR type projects. A proper plan should address this. It is also worth noting that the District doesn't necessarily operate for a full irrigation season in a dry year, nor does the Grenada Irrigation District, which also utilizes an unlined canal reported in their own documents as losing as much as 12 cfs when full, making for what should be a dynamic amount of canal leakage to gw value in the water budget, while the chart shows it as essentially straight line amount through all water year types. It appears that numbers have been over simplified with unknown consequences | Thank you for this comment. It will be taken into consideration for revisions in the final GSP and for improvements to the model during GSP implementation.<br><br>As referenced in the draft GSP (Chapter 2), comprehensive documentation of the water budget development process and the model is included in Appendix 2-E and is not included in this section of GSP. |
| David Webb for Friends of the Shasta River | FOSR-038 | C | WB | Specific Edit to Plan Requested | | 2 | 145 | | 2605-7 | The word "enhanced" while technically correct, presents the opposite feeling than what is needed to characterize conditions. Exacerbated would be a better word. | Text updated. |
| David Webb for Friends of the Shasta River | FOSR-039 | C | WB | Water Budget-Estimating Extraction | | 2 | 146 | | 2708-10 | The reduction in discharge isn't caused solely by the absence of natural recharge, but is also reduced by GW pumping. Since this is a plan leading to management of gw usage, its impacts should never be ignored. | A PMA has been added to address data gaps in the interconnected surface water, which includes collecting data on canal diversions and leekage. |
| David Webb for Friends of the Shasta River | FOSR-040 | C | WB | Water Budget | | 2 | 146 | | 2717-8 | This sentence should include not just reduction in precipitation , but also reduction in anthropogenic recharged, as from ditch and canal lining, projects which should include offsetting measures if publicly funded. | GSP text revised to include anthropogenic recharge changes impacting water table slope. |
| David Webb for Friends of the Shasta River | FOSR-041 | B | WB | Water Budget | | 2 | 146 | | 2722-4 | The claim that climatic reductions in recharge will not cause overdraft is not supported by the identified consequences in these sentences--all of these are undesirable effects. GW usage and hence what constitutes overdraft is going to shift in harmony with gw supply in order not to cause a diminishment of surface flows. | See MCR Overdraft |
| David Webb for Friends of the Shasta River | FOSR-042 | B | WB | Water Budget | | 2 | 146 | | 2724-2726 | This concept is not given proper adherence elsewhere in the document when talking about monitoring--The amount of decline in gw levels is going to be apparently related to a great degree to the underground flow rate/underground porosity. Nowhere is that factor captured in changes in gw elevation standards proposed. I.e. all wells are treated as equal in terms of % decline before requiring management action.. | See Section 2.2 and Appendix 2-A and 2-E. |
| David Webb for Friends of the Shasta River | FOSR-043 | B | WB | Specific Edit Requested | | 2 | 148 | | 2797-8 | No factual basis is provided for this assertion. It should be removed here and elsewhere. | See MCR "Overdraft" |
| David Webb for Friends of the Shasta River | FOSR-044 | C | GE | Specific Edit Requested | | 2 | 150 | | Fig 66 | This is too small to be useful. It needs to be available full sized electronically. The apparent if slight increase in discharge of gw into streams needs to be explained. Nowhere has that been done. | The water budgets will be individually plotted in the GSP rather than in a plot grid. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-045 | B | GD | Ecological Beneficial Users | | 2 | 151 | | 2826-8 | Her and elsewhere this plan fails to recognize the critical role of gw in supplying cold water to the system, and the fact that existing usage levels are already significantly diminishing that cold inflow, jeopardizing attainment of the TMDL, further endangering coho salmon, and putting Fall Chinook salmon more at risk. | See MCR "Surface Water Temperature" |
| David Webb for Friends of the Shasta River | FOSR-046 | B | WB | Sustainable Yield | | 2 | | | 2826-8 | The claim that the sustained yield for the Shasta Valley is 42-45 TAF/year hasn't been substantiated anywhere. AS such it is an unsubstantiated assertion here and absolutely needs to have its basis fully documented. That volume translates to 115-125 net CFS on a continuous basis for a 6 month growing season. That translates to 10,500-11,250 acres cropped with 4' of water per acre. In 2010 DWR estimated that approximately 10,200 acres were irrigated with just GW, an additional 1,230 acres were irrigated with a combination of surface and ground water, and no accounting was made of domestic use. At best there is no room for further expansion and that should be clearly noted. Also domestic use and illegal use needs to be factored in, along with planned reductions in gw irrigated acreages as recharge from canals is eliminated over time. We appear to have actually to have exceeded supply already, assuming that 115-125 cfs is even sustainable, which remaining instream flows say absolutely is not.. | See MCR Sustainable Yield |
| David Webb for Friends of the Shasta River | FOSR-047 | A | BR | Human Right to Water | | 2 | 151 | | 2816-2822 | While the assertion that the basin is not in overdraft, the previous comments suggests we are right on the edge. Beyond that, the experience of people whose wells have gone dry suggests that the out dated definition that looks only at long term ability to regain a spring-time gw level completely fails to protect gw users in mid summer if heavy irrigation use draws down summer levels below well depths, yet winter precipitation and soil porosity is still sufficient to allow full recharge. Hiding behind this interpretation does the citizens of the county no good, and only highlights the failure of the count to allow designating special management areas to address those areas experiencing summer water shortages.<br><br>Reliance on this definition is a violation of state policy " *It is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes"* | See MCR Overdraft |
| David Webb for Friends of the Shasta River | FOSR-048 | C | MN | Specific Edit to Plan Requested | | 3 | 6 | | 155 | Appendix Z should read Appendix 3-A | Edit Complete |
| David Webb for Friends of the Shasta River | FOSR-049 | C | MN | Monitoring Network PMAs | | 3 | 7 | | 167-74 | It would seem prudent to have these needed study items consolidated into a master PMA list to facilitate future funding. | See Chapter 4 for new PMAs that address these data gaps. |
| David Webb for Friends of the Shasta River | FOSR-050 | B | MN | Monitoring Network- Data Gaps | | 3 | 7 | | 178-93 | If the collection of the indicated data is needed, then there needs to be a fall-back approach identified to be utilized when/if voluntary measures fail to yield needed results. More detail is needed in terms of where the identified data is needed, at what well density, etc. | See MCR General Data Gaps |
| David Webb for Friends of the Shasta River | FOSR-051 | C | MN | Specific Edit to Plan Requested-Mapping | | 3 | 8-11 | | maps | These maps are somewhat redundant, are too small to convey much useful information, and there is an excess of white space. The maps could be larger, and have key roads on them for helping know what is where. | Edit Complete |
| David Webb for Friends of the Shasta River | FOSR-052 | B | PM | Monitoring Network PMAs | | 3 | 12 | | 221-5 | PMAs should be recognized as being made up of both actions taken, and actions avoided/not taken. The county has made it clear that any actions that will reduce existing gw usage are going to be stringently avoided--an example of actions deliberately not taken. Monitoring wells should be adequately distributed in areas where those actions avoided are likely to have undesirable impacts to adjoining gw users and or ISW. | See MCR General Data Gaps |
| David Webb for Friends of the Shasta River | FOSR-053 | C | MN | Monitoring Network PMAs | | 3 | 12 | | 236-7 | This sentence imparts no useful information. If it is supposed to be saying something it needs to be written. | Edit Complete |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-054 | B | MN | Monitoring Network PMAs | | 3 | | | 246-50 | Activities on the West side of the River need to be tracked and monitored separately from those on the East side. Likewise Pluto's Cave Basalt really needs its own monitoring plan with triggers and actions. | The GSA has elected to not use management areas at this time. |
| David Webb for Friends of the Shasta River | FOSR-055 | B | DW | Domestic Well Failure | | 3 | 12 | | 256-8 | While they may lack numeric data for depth to water over multi-years, the fact that domestic wells near A-12 are going dry should be treated as a long term trend if the owners can indicate that in past years no such problems existed and as a result of declining water levels, now they do. With luck some or all of them will have a reliable depth to water at the time of drilling, to be compared to current problematic depths, providing an indication of long term trends. | The GSA needs qualitative data and documentation of dry domestic wells. Affected well users should report their dry well to the state or GSA and/or provide water level data to the GSA. |
| David Webb for Friends of the Shasta River | FOSR-056 | B | MN | Monitoring Network PMAs | | 3 | 18 | | 281-4 | It would seem prudent to add to the list of projects the securing of extra well loggers to be standing by so that wells deemed potentially needed can be monitored on a preliminary basis and/or added immediately should they prove to be essential to proper management. they would also be good to have in the event of logger failure. | See Chapter 4 and 5. |
| David Webb for Friends of the Shasta River | FOSR-057 | C | MN | Monitoring Network PMAs | | 3 | 18 | | 286-7 | Given the importance of the wells supplying Lake Shastina, it seems like they should be immediately added to the monitoring network if the CSD is willing. Specific outreach to them is in order. | The initial groundwater level monitoring network is based on the DWR-funded CASGEM well network, which does not include any wells near Lake Shastina. Additional wells may be added to the monitoring network for the 5-year GSP update, such as near Lake Shastina. |
| David Webb for Friends of the Shasta River | FOSR-058 | C | MN | Monitoring Network-Groundwater Levels | | 3 | 18 | | 288-90 | It seems likely that DWR guidance for well density is poorly suited to a volcanic area such as the Shasta Valley, with its convoluted and confused geology and hence hydrology. that should be clearly noted so as to allow finding funding for a greatly expanded monitoring network. | PMAs have been added to Chapter 4 to expand the current monitoring works. Monitoring networks will be expanded based on the data gap appendix (Appendix 3-A) and modeling needs. |
| David Webb for Friends of the Shasta River | FOSR-059 | B | MN | Monitoring Network Schedule, Domestic Wells | | 3 | 22 | | 305-8 | 2x annual monitoring may be good enough for some purposes, but protection of domestic wells in a meaningful fashion requires near-real time monitoring during critical periods. There should be a separate focus on meeting domestic needs in near real time, with monitoring, triggers and actions defined. | See MCR General Data Gaps |
| David Webb for Friends of the Shasta River | FOSR-060 | B | MN | Monitoring Network Groundwater Storage | | 3 | 22 | | 318-21 | It appears that the SWGM cannot provide a numeric value for Storage as the text here states, but only an indication of whether it is increasing or decreasing or staying the same based on gw elevation. Is this correct? If so the language needs to be corrected. If not, additional information needs to be included in Appendix 2-E to explain how a model utilizing cross section data with an unknown boundary between usable water bearing strata and the Hornbrook formation, with seemingly no data known for subsurface porosity, and gw levels at the edge of the river varying from above and below stream water level, is able to estimate volume of groundwater. Perhaps an illustration. | See MCR HCM |
| David Webb for Friends of the Shasta River | FOSR-061 | B | WI | Well Inventory | | 3 | 23 | | 363-6 | Developing a plan based solely on what is available free or cheap seems arbitrary at best. It would be more appropriate to first develop an ideal plan, then see what if any existing wells approximate it. After that others need to be secured. Having such a plan should facilitate securing funding for additional wells. | See MCR General Data Gaps |
| David Webb for Friends of the Shasta River | FOSR-062 | B | WI | Monitoring Network- Data Validation, Well Inventory | | 3 | 24 | | 366-7 | This speaks to the need for equipment, specifically a down-hole camera to be used to capture screening details. Use of it might also help to further validate well logs, and cause those not accurate to be discarded from use. | See Chapter 4 |
| David Webb for Friends of the Shasta River | FOSR-063 | B | WI | Monitoring Network- Data Validation | | 3 | 24 | | 367-8 | USGS examined 21,400 well logs (as reported in USGS Bulletin 1766) in eh Central Valley, and found that only 590 of them had sufficient information on screening and water depths to be usable in assessing gw availability in the Central Valley--2.8%. We should expect no better here. A program needs to be established and funded where-by a trained geologist accompanies drillers to perform well logging in key areas when wells are being drilled there, along with a down hole camera to capture and/or validate well log information or add to it. | See Chapter 4 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-064 | C | MN | Monitoring Network: Well Characteristics | | 3 | 24 | | 381-2 | Does it matter if a well to take a water sample from is domestic or Ag? Might other parameters matter more especially water source depth and proximity to known or suspected sources of Water Quality problems? | The monitoring network must be representative of all users (municipal, agricultural, domestic), land use, and water bearing formations. The lack of domestic wells and agricultural wells is a large data gap. Firstly, wells used for different uses generally tap into different water bearing formations (ie., domestic wells tap into shallow groundwater and agricultural tend to drill much deeper wells). Secondly, monitored domestic wells would assist in documentation and management if wells go dry. |
| David Webb for Friends of the Shasta River | FOSR-065 | B | MN | Monitoring Network PMAs | | 3 | 27 | | 397 | It seems as if a plan should have sequential steps evaluated for relevance via the prioritization process, then organized into a table, making it clear that each is an essential step that is part of a well organized plan. This SGMA plan is long on explanation, which is good, but short on identified and organized action items. That really needs to be fixed. Here, there needs to be an action item explicitly committing to doing something specific with regards to adding more wells and/or drilling dedicated wells, or at least a process for deciding those details. | See MCR General Data Gaps |
| David Webb for Friends of the Shasta River | FOSR-066 | C | WI | Monitoring Network: Well Characteristics | | 3 | 27 | | 408-10 | Section 3.3.4.1 really doesn't provide any enlightenment on where and how and how many additional wells will be selected. | Edit Complete |
| David Webb for Friends of the Shasta River | FOSR-067 | C | GE | Specific Edit to Plan Requested | | 3 | 29 | | Fig 6 | Description does not match illustration. Illustration needs to be made clear--is it hypothetical for the Shasta Valley, or data based? Does the table refer to the 70 cfs discharge or 35 cfs? | Edit Complete |
| David Webb for Friends of the Shasta River | FOSR-068 | B | MN | Monitoring Network Impacts on GDEs, Environmental Beneficial Users | | 3 | 29-30 | | 487-95 | While this methodology could be able to work well given proper targets, there seem to be unrecognized issues that need to be resolved before it can hope to be reliable. First, aquatic organisms do not live on 2 year averages, or any other long term metrics. They live or die in the moment, depending on river flow, temperature, and dissolved oxygen levels. Properly protecting GDEs and ISW will require a real time monitoring and response process, not one apparently intending to look at 2 years of data prior to taking anything seriously, and even then perhaps not acting on those observations other than study them more. As a "Plan" this needs to recognize that reality and specify triggers and actions to be taken. Secondly, , many diverters, either by choice or at the direction of the water master do not divert their full water right continuously. Somehow that needs to be captured in a real time basis. At present that is not possible and needs to be created ASAP so as to utilize the full 5 year window. Third, from 20+ years of working with irrigators, developing irrigation efficiency studies, and educating myself on irrigation practices, it is painfully obvious that no one is 100% efficient. 50% is as good as is normally encountered. Persons with difficult to irrigate ground, or excessive water rights can do even worse. The excess water they apply is not consumed, and in instead generally finds its way back to the river, either very quickly as surface tailwater, or a little more slowly as subsurface return flow. The rapidity of those process can be visualized by the response of the river at the end of the irrigation season when the river rapidly rises to a static flow, but doesn't rise up then decline as diversion ceases and tailwater continues to supplement natural flow. Having the water master inform you of the gross diversion Q every 2 weeks is of little or no value in terms of determining surface depletion or meeting the minute by minute needs of aquatic systems. Somehow you will have to arrive at a real time value for ET in order to be able to know what the depletion is from surface diversion.<br><br>Finally, as a general observation the SPU gauge seems far more useful as an index of GW discharge to the stream from nearly all sources than would a complicated process of trying to work out a water balance with multiple users doing unpredictable things as the whim strikes them. | See MCR ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-069 | B | MN | Monitoring Network: Locations | | 3 | 30 | | Table 4 | SV02 seems to be oddly placed to monitor GW levels for anywhere except very close to where it exactly is. I have seen no explanation as to why this location was chosen--it appears to have been arbitrarily selected on some other basis other than functionality. It is completely unclear how it can be expected to be representative of GW levels anywhere else, especially in areas where GW is discharging to the stream. Review of data from SRM and SRY suggest that about 5-10 cfs is added to stream flow between SRM and SRY in the absence of precip., suggesting that GW is of little significance between those two stations, especially when compared to the 70-150 cfs that discharges tot eh river upstream of SPU, where monitoring of gw levels would seemingly be far more useful. This site either needs to be fully justified vs. other potential sites, or some other site(s) than can be justified chosen. Given the acknowledges uncertainty of how best to properly manage gw in the absence of adequate information, it would seem far more sensible to monitor multiple sites in the expectation that one will be unpredictably better than he others, rather than arbitrarily settle on one location and hope for the best while waiting for 5 years to discover no useful information was gained. These observations are supported by lines 871-5 in this document, ch 3. | See MCR GDE |
| David Webb for Friends of the Shasta River | FOSR-070 | B | MN | Monitoring Network Data Gaps | | 3 | 30 | | 509-11 | While a target of 2032 may or may not be reasonable, I have not seen any specific steps identified that will make addressing the details of the Little Shasta any easier or more doable in 2032 than it is now. Data gaps, along with proposed steps that need to be taken to fill them need to be identified, along with a timeline for accomplishing them. | See MCR ISW |
| David Webb for Friends of the Shasta River | FOSR-071 | B | MN | Monitoring Network Data Validation | | 3 | 31 | | 513-521 | The validity of this approach isn't immediately apparent, and needs to be more fully developed and explained especially with regards tot eh rationales used. In >30 years of driving I-5 over Parks Creek, and always driving in the fast lane when going across the Parks creek bridge so as to be able to see the creek where it crossed the Mills ranch low water crossing under I-5. In all those years, I have never seen a no flow condition other than this summer. I question if it should be adopted at the expected target prior to initiation of monitoring. Both Parks Creek has spring flows both above and below the "dry reach", flow that is in large part diverted. Again, I am not sure exactly what is being tracked by this process. The Little Shasta has substantial flow upstream of the dry reach, again diverted, and possibly about to be supplemented by 1707 water from the Hart Ranch. Again, just how this process yields useful information isn't clear. | See MCR ISW |
| David Webb for Friends of the Shasta River | FOSR-072 | C | MN | Monitoring Network Schedule | | 3 | 31 | | 522-3 | These two sentences seem contradictory--will the monitoring be continuous or 2x annually? | Edit Complete |
| David Webb for Friends of the Shasta River | FOSR-073 | C | GL | Specific Edit to Plan Requested: Groundwater Level | | 3 | 35 | | 599-605 | "Excessive" needs to be defined or described, as does "adverse". Without definition this section is meaningless. | See MCR "SGMA" |
| David Webb for Friends of the Shasta River | FOSR-074 | A | DW | Domestic Well Failure | | 3 | 36 | | 614-5 | Selecting as a target the drying up of domestic wells as an acceptable and anticipated outcome when it could be prevented by proper management and sharing of eh GW resource is not acceptable as a planned approach. I hope the people likely to be affected are outraged. Will your recommend red tagging homes with no water supply for that portion of the summer when there is none? | The minimum threshold for water level does not allow for water levels to decline below historic water levels except for a small margin to provide some operational flexibility. This will minimize the impact of well outages. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-075 | A | GL | Groundwater Elevation Minimum Threshold | | 3 | 36 | | 638-42 | This 75th percentile and 10% buffer seems to be completely arbitrary, with no basis for determining if it is protective of all uses. Additionally, it appears that it would allow pockets of severe impacts to the functionality of most wells, as long as elsewhere in the watershed things were doing better enough to meet the 75th percentile overall. Given the complicated geologic conditions and substantial unknowns, this doesn't seem like an acceptable approach. Something more protective of domestic users along with GDEs and ISW needs to be selected, especially for the first 5 years. It needs to be recognized that all existing wells almost certainly have been adequate for meeting domestic needs for all years since they were drilled, until the last 2 years. That potentially decades long history shouldn't be ignored, just because a depth to water value is unknown. It is known that the depth to water was above the level of the pump until excessive extraction relative to supply occurred in 2020 and/or 2021. | See MCR "ISW" and "Well Outtage Appendix" |
| David Webb for Friends of the Shasta River | FOSR-076 | C | IS | Specific Edit to Plan Requested | | 3 | 40 | | 720-21 | The Shasta River jumps up within 2-3 days of the cessation of most irrigation on or before October 1, regardless of any precip. That flow is a direct measure of the then-impaired gw discharge to the stream. This sentence appears to belong in the Scott watershed, not the Shasta | Edit complete |
| David Webb for Friends of the Shasta River | FOSR-077 | C | IS | Specific Edit to Plan Requested | | 3 | 40 | | 723 | This sentence appears to refer to the Scott River also. | Edit complete |
| David Webb for Friends of the Shasta River | FOSR-078 | C | IS | Specific Edit to Plan Requested | | 3 | 40 | | 727-28 | This sentence appears to refer to the Scott River also. | Edit complete |
| David Webb for Friends of the Shasta River | FOSR-079 | A | IS | ISW Depletion-Impact to Environmental Beneficial Users | | 3 | 41 | | 751-2 | It needs to be noted that adverse impacts happen to junior water users in all or essentially all water year types (i.e. GID always gets curtailed sooner or later each summer). That is easy to document. Equally important, aquatic organisms are negatively impacted each year as a result of low flows, excessive temperatures, low levels of dissolved oxygen and passage barriers. The presence of those impairments should be sufficient to define a gw dependent ecosystem as in chronic overdraft during each summer and Fall. there is certainly no need to wait for 2 years in a row of some other impacts to make that determination. This has been the case since 1916. | See MCR ISW and GDE |
| David Webb for Friends of the Shasta River | FOSR-080 | B | IS | ISW Depletion-Impact to Environmental Beneficial Users | | 3 | 42 | | 796-801 | The multiple deficiencies of this approach were described above. | See MCR ISW and GDE |
| David Webb for Friends of the Shasta River | FOSR-081 | B | IS | ISW Depletion-Impact to Environmental Beneficial Users | | 3 | 45 | | 842 | Artificially imposing the "Fall Minimum" (plus buffer?) as an acceptable target is likely to result in reproductive failure when GDE plants generally need surface water for seed germination, followed by a slow decline in water level below the surface. This will potentially yield the same results as are seen in the Shasta River at eh beginning of the irrigation season when water levels unnaturally drop in advance of the release of willow seeds, effectively eliminating natural recruitment. | See MCR ISW and GDE |
| David Webb for Friends of the Shasta River | FOSR-082 | B | IS | ISW Depletion-Impact to Environmental Beneficial Users | | 3 | 45 | | 844-5 | It seems unlikely that satellite imagery will be able to discern the above reproductive failure, but will instead track the presence of mature over story plants until they get old and die, with nothing to replace them. By that point cause and effect are likely to be unlinked in people's minds. | See MCR ISW and GDE |
| David Webb for Friends of the Shasta River | FOSR-083 | A | IS | ISW Depletion-Impact to Environmental Beneficial Users | | 3 | 45 | | 849 | Again, selecting 100 cfs as the MT appears to be entirely arbitrary, especially given that Figure 10 shows that flows that low only occurred in one unusually dry year since 2010. At this point, there would seem to be sufficient data to select targets based on average conditions or past water year types for which we have data, pending the collection of more data, not the lowest number available. Setting a low number will only provide an opportunity to allow additional gw development to take place while the next 5 years pass, assuming they are normal water years and not a continuation of drought. Adding to the existing overdraft condition will only make future management harder. In the face of considerable uncertainty, a conservative approach should be taken. | See MCR ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-084 | C | IS | Request for Clarification | | 3 | 45 | | 856-7 | To be useful, it is necessary to know the surface elevation of the river closest to this well--what is it vs. the MSL elevation of the water target in this well? | GDEs are dependent on groundwater levels, not river levels. No editing has been done. |
| David Webb for Friends of the Shasta River | FOSR-085 | C | IS | ISW Depletion-Impact to Environmental Beneficial Users | | 3 | 45 | | 857 | This depth to water appears to preclude the establishment or survival of any GDE native to the Shasta Valley. Please explain how that relates to line 855. | Edit complete. The well is not directly measuring groundwater levels within the GDE, just nearby groundwater levels. It is a proxy groundwater well, where the minimum threshold is based on its historical record. The monitoring network does not currently have shallow wells to directly measure groundwater levels within GDEs. |
| David Webb for Friends of the Shasta River | FOSR-086 | A | IS | ISW Depletion-Impact to Environmental Beneficial Users | | 3 | 45 | | Table 8 | Suddenly this table says the MT can now be 80cfs (20% less than 100 cfs). Nowhere is that mentioned nor justified. 100 cfs is already unreasonably low. This is bait and switch. If a 20% buffer is needed, then the MT should be set 20% higher than any acceptable minimum, or 125 cfs. | See MCR ISW |
| David Webb for Friends of the Shasta River | FOSR-087 | C | IS | ISW Depletion-Impact to Environmental Beneficial Users | | 3 | 45 | | 864-8 | The importance of these lines is not clear and they need to be better explained. Historic data needs to be supplied for this well to allow the numbers presented to be evaluated. | Well data is presented in Appendix 2-C. |
| David Webb for Friends of the Shasta River | FOSR-088 | B | WQ | Water Quality Monitoring | | 3 | 49 | | 1003-4 | No adequate justification is provided for limiting water quality tracking to these tow constituents only. In addition, language in lines 1073-5 acknowledges that subsurface gw flows in any direction are possible in the presence of heavy gw pumping, potentially mobilizing naturally occurring contaminants from where they are naturally found to areas where they won't be expected nor looked for. Less frequent but periodic monitoring is needed to provide indications of this should it begin to occur. | See MCR Water Quality |
| David Webb for Friends of the Shasta River | FOSR-089 | C | WQ | Request for Clarification: Harter Reference Document | | 3 | 51 | | 1096-7 | I have looked through the Harter reference, and can find no justification for the statement here to the effect that Shasta Valley CAFO stocking densities are not of concern. As such, that assertion is not supported by any facts and must be seen as arbitrary. Please provide a page number if I am mistaken. | The text was updated to indicate that currently it is unkown whether animal farms are of concern, but that monitoring wells at dairies in Shasta Valley will help determine if there is concern and will be included in the GSP update. |
| David Webb for Friends of the Shasta River | FOSR-090 | C | GE | Request for Clarification: USGS Reference Document | | 3 | 61 | | 1349-51 | I was unable to find any such reference document. Please provide a proper link and/or title | The link to the reference document is correct. |
| David Webb for Friends of the Shasta River | FOSR-091 | C | GA | Role of GSA | | 4 | 2 | | 60-3 | The GSA should be explicitly identified as having responsibility for commenting both in favor and opposed to activities, both those brought to it for endorsement, and other publicly funded activities that further or retard GWMP goals | The GSA will act as the groundwater agency for the county. |
| David Webb for Friends of the Shasta River | FOSR-092 | C | GE | Role of GSA | | 4 | | | 80-5 | The plan fails to live up to this goal, particularly in regards to its failure to in any way acknowledge or address the absolutely essential role discharged groundwater plays in providing cold water refugia and in overall water temperature protection. | See MCR "Surface Water Temperature" |
| David Webb for Friends of the Shasta River | FOSR-093 | C | GA | Role of GSA | | 4 | | | 88-9 | Again, as a responsible management agency the GSA should be prepared to speak up to both support and oppose future proposed activities. Merely staying silent on detrimental projects isn't acceptable. | The GSA will act as the groundwater agency for the county. |
| David Webb for Friends of the Shasta River | FOSR-094 | A | PM | PMA Selection Criteria | | 4 | | | 131-3 | I have not seen criteria for rejection of any project, just higher or lower scores, with no suggested threshold for rejection either as inadequately beneficial vs. cost, or likely to cause harm. That leaves the door open for "smokescreen" and "sweetheart" projects | See PMA Selection Criteria |
| David Webb for Friends of the Shasta River | FOSR-095 | A | PM | PMA Selection Criteria | | 4 | 9 | | Table, row 2 | In addition to leasing, higher priority should be given to permanent purchase of water. Leasing is appropriate for temporary situations. These issues are not temporary. | See PMA Selection Criteria |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-096 | A | PM | PMA Selection Criteria | | 4 | 9 | | Table, row 3 | "irrigation efficiency" should never be given blanket endorsement--such projects often lead to an expanded irrigation footprint, reduction in anthropogenic recharge, and the transfer of "saved" water to more upstream junior users. Where mentioned language should include something along the lines of "carefully vetted" irrigation efficiency projects "scrutinized to assure no unintended consequences result". Particular scrutiny should be given to NRCS projects, in that NRCS is legislatively constrained to looking at only "on farm" impacts for the project recipient, not community, basin wide or off farm unintended consequences. | See PMA Selection Criteria |
| David Webb for Friends of the Shasta River | FOSR-097 | C | PM | PMAs: Project Feedback | | 4 | 10 | | Table, row 2 | ILR sounds like a benign approach, but to the extent that it allows a diminution of gw discharge to the stream by replacing it with a similar volume of the mixed natural water and tailwater that constitutes current river flow, it undermines essential water quality needs and goals in terms of water temperature and potentially nutrient loading. It is often unlikely to be overall beneficial at meeting the combined water management goals the river must achieve from all regulatory agencies. | As part of the ILR implementation, there would be further assessment of potential benefits and challenges prior to full scale implementation. |
| David Webb for Friends of the Shasta River | FOSR-098 | C | PM | PMAs: Project Feedback | | 4 | 10 | | Table, row 3 | It is inappropriate to propose large physical project such as this without first doing a preliminary engineering study to document its likelihood of success. Nowhere is that essential first step proposed. | See MCR "PMA Selection Criteria". |
| David Webb for Friends of the Shasta River | FOSR-099 | C | PM | PMAs: Project Feedback | | 4 | 10 | | Table, Row 4 | This approach also needs to have a preliminary study and action plan in place well before any needed implementation so that actual implementation can be carried out in a fair and effective fashion, with minimal surprises or discussion-related delays. No such study and plan development is proposed anywhere, effectively preventing groundwater curtailment as a real option. | See MCR "PMA Selection Criteria". |
| David Webb for Friends of the Shasta River | FOSR-100 | C | PM | PMAs: Project Feedback | | 4 | 11 | | 211 ff | Significant portions of this project have been the subject of a Notice of Violation from the SWRCB for violation of state water law. It is an example of a (deliberately?) flawed examination of project details before investing money in preliminary studies, and/or the preparation of funding requests. Endorsing projects with illegal components undermines the credibility of the GSA and will impact the future effectiveness of it. | See MCR "PMA Selection Criteria" |
| David Webb for Friends of the Shasta River | FOSR-101 | C | PM | PMAs: Project Feedback | | 4 | 12 | | 225 | This project needs to be expanded, especially in the area between river mile 15.5 and 31 that becomes a losing reach over the course of the summer under current gw usage conditions. | Thank you for this comment. Subject to funding availability, the GSA tentatively plans to expand this project to other locations in the Basin, including the one referenced in your comment. |
| David Webb for Friends of the Shasta River | FOSR-102 | C | PM | Specific Edit to Plan Requested | | 4 | 12 | | 236 | As of 9/22 this appendix appears not to exist | The text has been edited to refer to the correct appendix. |
| David Webb for Friends of the Shasta River | FOSR-103 | B | PM | PMAs: Project Feedback | | 4 | 13 | | 264-73 ff | Needing to be added here are projects to perform preliminary engineering studies of most Tier 3 actions, to complete instream flow studies so as to quantify the availability of "excess water" for storage projects or MAR, to define likely benefits of proposed MAR experiment, funding for water acquisition, funding for well installation to fill data gaps, funding for hiring a qualified geologist to accompany well drillers to prepare reliable well logs, either local legislation requiring above geologist on wells, or incentive payment to landowner and driller for allowing geologist to log well while being drilled, funding or additional piezometer transects between rm 15.5 and 31, and elsewhere, studies to quantify accurately the recharge occurring from unlined ditches so as to respond appropriately as they become lined over time, studies to define underground transit times in various areas to set a foundation for evaluating recharge and water banking proposals, | See Chapter 4 and 5. |
| David Webb for Friends of the Shasta River | FOSR-104 | C | PM | Specific Edit to Plan Requested | | 4 | 14 | | 309 | Add "canal leakage" to the list of recharge sources | Edit Complete |
| David Webb for Friends of the Shasta River | FOSR-105 | C | PM | Specific Edit to Plan Requested | | 4 | 14 | | 311 | Replace "lead to" with "are indicative of" | Edit Complete |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-106 | B | PM | Environmental Beneficial Users | | 4 | 14 | | 321-23 | As noted elsewhere in the plan, gw usage has decreased the flows from Big Springs alone by approximately 1/2 ( ~60 cfs),, severely degrading the ability of the river to support groundwater dependent ecosystems, specifically cold water fish, or to support existing surface water users. This plan needs to acknowledge that failure to reverse, or partially reverse that impact will guarantee continued uncertainty and risk of litigation. Using as a stated goal the continuation of the current usage levels is not acceptable. | See MCR "ISW" |
| David Webb for Friends of the Shasta River | FOSR-107 | A | PM | Groundwater Use Estimate | | 4 | 14 | | 328-9 | Comparing the 5 or 10 year average ET to the maximum ET observed between 2010 and 2020 will result in an increase in gw usage. It should be compared to the comparable average between 2010 and 2020; | Noted. |
| David Webb for Friends of the Shasta River | FOSR-108 | B | PM | Groundwater Use Estimate | | 4 | 15 | | 350 | To meet this standard, it isn't sufficient to minimize future extraction. It will also be necessary to reduce current extraction proportionately to identifiable reductions in recharge. Specifically, 8 miles of publicly funded canal lining by the Montague Irrigation District slated for completion in 2021, and is intended to reduce gw recharge by approximately 28 cfs continuously, during all periods when the canal is running full. Estimates and modeling were based on a time frame when that leakage was customarily part of the working gw system. See further comments on the topic in Ch2 comments. Other individuals and entities are similarly taking steps that will reduce their recharge, with no effort within this plan to track, offset, or oppose the substantial and measurable losses. | It is unclear whether the additional 28 cfs delivered to Montagues Irrigation District will be recharged there or whether additional consumptive uses will be created (e.g., more acreage to be irrigated). The latter would constitute an undesirable expansion of net consumptive use in the basin. |
| David Webb for Friends of the Shasta River | FOSR-109 | C | DW | Domestic Well Failure, Groundwater Levels | | 4 | 16 | | 402 | The unsubstantiated statement, that "Currently, there is no threat of chronically declining water levels in Shasta Valley" is not supported by any preventative measures yet in place to limit gw extraction to its current levels, let along levels that would not result in undesirable results. In fact numerous domestic users are finding that they are increasingly without water as a result of declining water levels that is becoming more problematic each year. | The minimum threshold for water level does not allow for water levels to decline below historic water levels except for a small margin to provide some operational flexibility. This will minimize the impact of well outages. PMAs will be used to prevent the minimum threshold to be exceeded. |
| David Webb for Friends of the Shasta River | FOSR-110 | B | GE | Specific Edit to Plan Requested: References to Overdraft | | 4 | 16 | | 403 | The unsubstantiated statement "the basin is not in an overdraft condition" here and elsewhere is in direct contradiction to data documenting that Spring flows in summer, as measured at Big Springs, have declined by ~ 60 cfs. That loss of cold water both where measured in Big Springs, and presumably from other springs fed by the Pluto's Cave Basalt has directly and adversely affected the ability of the river to support its most iconic GDE species--salmon, both coho and Chinook. Additionally, the decrease in gw discharge to the surface has directly impacted junior water users who are increasingly frequently curtailed by the water master. The presence of one or more undesirable results is the definition of an overdraft condition., The Shasta River meets that definition. All statements claiming not to be in overdraft condition should be removed. | Not all undesirable results are related to overdraft conditions. Undesirable results related to all sustainable management criteria may occur even without overdraft. |
| David Webb for Friends of the Shasta River | FOSR-111 | B | GE | References to Overdraft | | 4 | 16 | | 416-7 | The Shasta River is not a gaining stream at all times as a direct result o excessive gw pumping. Specifically, data has been presented to the project consultants by the water masters showing that the Shasta between River miles 15.5 and 31 became a losing reach by the end of the summer in 2020. Data for other years is not available, but since little has changed in terms of gw usage in 2020 vs. recent years, there is no reason to presume this has not been an ongoing condition. That data documenting the annual development of a losing reach in the river should be included as an appendix so the public can readily see and understand it, and support appropriate measures to address it. | See MCR "ISW" |
| David Webb for Friends of the Shasta River | FOSR-112 | C | GE | Specific Edit to Plan Requested | | 4 | 17 | | 427 | Add the words "canal leakage" as another source of recharge. | Edit Complete |
| David Webb for Friends of the Shasta River | FOSR-113 | C | PM | Managed Aquifer Recharge | | 4 | 17 | | 436-7 | The observation that gw levels slope from the basin margins towards eh Shasta River should color MAR concepts. MAR on the west side of the river (as is proposed herein elsewhere) will not benefit gw levels or users on the East side of the river, where identifiable shortages now exist. No explanation is provided as to why MAR is being proposed in this unfruitful area. | Locations for MAR has not yet been proposed and will be explored with a feasibility study, as discussed in Chapter 5. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-114 | C | GE | Recharge | | 4 | 17 | | 446-7 | This statement conveniently ignores the other sources of recharge, specifically canal leakage and deep peculation from excess irrigation, reductions in both of which are currently and for years have been the focus of public and private pending. | Edit Complete |
| David Webb for Friends of the Shasta River | FOSR-115 | C | GE | Reference to Overdraft | | 4 | 18 | | 470-1 | This statement ignores the SGMA use of the presence of one or more undesirable conditions as the indicator of overdraft, an error made throughout the document. | Not all undesirable results are related to overdraft conditions. Undesirable results related to all sustainable management criteria may occur even without overdraft. |
| David Webb for Friends of the Shasta River | FOSR-116 | C | PM | PMAs- Climate Change | | 4 | 18 | | 473-5 | Merely stating the existence of diminishing amounts of precip. isn't enough. Where is the response to this fact? Instead throughout the document there is a concerted effort to continue the slowly expanding and demonstrably excessive usage of gw, and to ignore the developing climatic trend that calls out for a conservative approach until climatic conditions prove otherwise. That is not a plan. at best it is an ex That is not a plan. at best it is an excise in wishful thinking. | Future climate simulations under current land use conditions demonstrate that water levels are not in chronic overdraft. |
| David Webb for Friends of the Shasta River | FOSR-117 | C | MU | Coordination with Land Use Zoning | | 4 | 19 | | 511 ff | Reliance on zoning seems misplaced, particularly with the proposed urban "partners" within whose jurisdiction little or no gw usage for irrigation occurs. Why is there no mention of a moratorium on the issuance of new well drilling permits for wells >6" diameter or similar county level actions that would immediately halt gw usage expansion, but instead pointing to a long, cumbersome and difficult process not likely to occur? | This option has not been discussed as a PMA by the advisory committee. |
| David Webb for Friends of the Shasta River | FOSR-118 | C | PM | Well Replacement PMA | | 4 | 19 | | 518--box | Example 2--There is no existing nor proposed county staff position that will be monitoring agreements such as is described, nor is there a penalty nor other recourse if the agreement isn't adhered to. It is also unclear if this example agreement runs in perpetuity, or only for 10 years. | Chapter 5 has been expanded to outline, in more detail, the implementation plan. |
| David Webb for Friends of the Shasta River | FOSR-119 | C | PM | Well Permitting | | 4 | 22 | | 558-60 | There should be an appropriate sharing of additional gw between gw users, surface users and GDEs. | Noted. |
| David Webb for Friends of the Shasta River | FOSR-120 | C | PM | Specific Edit to Plan Requested | | 4 | 23 | | 588-9 | The plan should note where this baseline data is located, and how it was calculated so that it can be independently verified over time. | Noted. |
| David Webb for Friends of the Shasta River | FOSR-121 | C | TR | Transparency, Multi-benefit, Inter-agency PMAs | | 4 | 24 | | 635-6 | Deliberately positioning the GSA to endorse someone's pet projects with little or no relevance to gw management is inappropriate. The GSA members have had many years of opportunity during which time they have frequently met with the specific "other agencies" responsible for such projects. This is a transparent effort to enhance the fundability of projects that should stand on their own, and not deplete gw related funding. | GSA implementation will require cooperation and collaboration between different agencies, particularly for grant funding. The GSA must also help protect groundwater dependent species (see Section 2.2.2.7) and species dependent on interconnected surface waters. |
| David Webb for Friends of the Shasta River | FOSR-122 | C | PM | PMAs: Irrigation Efficiency Projects | | 4 | 24 | | 641-4 | Irrigation efficiency improvements cannot be given a blanket endorsement. Each needs to be individually assessed to determine all its effects. As already pointed out, recharge from leaking ditches is substantial, and is relied upon unknowingly by many gw users in the basin, as is deep percolation. Reduction in those avenues of recharge need to be offset by equivalent reduction in gw demand. | The complex interaction between groundwater, surface water, and canal usage will be assessed with the Shasta Valley Integrated Hydrologic Model. |
| David Webb for Friends of the Shasta River | FOSR-123 | C | PM | PMAs: Juniper Removal Efficacy | | 4 | 25 | | 669-70 | Published University of California Extension Service research by Kuhn et. al. (*Juniper removal may not increase overall Klamath River Basin water yields* , California Agriculture, Volume 61, #4, 2007) suggests that gw benefits from this effort will be negligible. If it is undertaken as a gw management exercise, any benefits need to be documented by measured gw results, not by theoretical expectations. | See MCR "PMA Selection Criteria". The mentioned study and further research would be taken into account during the prioritization process. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-124 | A | PM | Voluntary Reporting of Groundwater Pumping | | 4 | 25 | | 674 | Complete reliance on voluntary participation is at best disingenuous. There needs to be a fall-back method in place for when voluntary efforts are inadequate to generate needed data. Additionally, the existing well log based data base of existing wells is incomplete to an unknown degree. Without an accurate accounting of the total number of wells, evaluating the representative nature of any voluntary data will be impossible. There at minimum needs to be a method proposed for arriving at a count of total wells so that the representative nature and locations of any volunteered wells can be verified. One approach would be to secure from PP&L a total count of agricultural pump power drops, and subtracting from that the number of surface diversion pumps. | See MCR "PMA Selection Criteria". Additionally, a well inventory program is included as a PMA in Chapter 4. |
| David Webb for Friends of the Shasta River | FOSR-125 | A | BR | Endangered Species Act, Streamflow | | 4 | 26 | | 724-6 | While stream flow augmentation by reducing diversions will yield desirable results, it cannot be overlooked that in addition to wet water ESA listed coho salmon require cold water, water already depleted by existing gw usage. Further planned depletion might well violate section 9 of the ESA. Given that, they cannot be accurately said to "effectively offset" an increase in gw usage. | See MCR "Surface Water Temperature" |
| David Webb for Friends of the Shasta River | FOSR-126 | A | HM | Selecting Projects Using the Hydrogeologic Model: Water Quality and Instream Flows | | 4 | 27 | | 766-9 | Use of the SWHM model for project assessment alone is not consistent with claimed plans to work with other agencies in that it has apparently no water quality component, most importantly for assessing temperature impacts on large and small refugia areas. Neither does it attempt to address minimum instream flow requirements. Project evaluation needs to be more appropriately comprehensive focusing on not reducing the likelihood of attaining all other mandatory water related targets, and in spreading any burdens fairly. | See MCR "Surface Water Temperature", "Public Trust Doctrine", and "ISW" |
| David Webb for Friends of the Shasta River | FOSR-127 | C | PM | Request for Clarification: Specific PMA | | 4 | 27 | | 771 ff | As presented, this appears to be a construction project, without first performing proper feasibility and preliminary engineering studies to document availability of "excess water", reasonable locations and size, potential costs, residence time, and reasonably expected benefits. If it is intended to be a preliminary study, then it should clearly be described that way only, with no fore-ordained outcome in terms of a physical project to follow, as it is currently described. It is worth noting that no mention of a gw shortage for **existing** gw users in the area identified have been made known at the advisory committee meetings. Beyond a project specific preliminary investigation, there needs to be the completion of an instream flow study in order to document the availability of excess water with which to do recharge on a regular enough basis to be useful. Proposed ownership of the stored water needs to be identified, as does its planned disposition, and how this meshes with the Grenada Irrigation Districts plans to initiate reliance on groundwater in lieu of river water so as to avoid water master curtailments. | See MCR "PMA Selection Criteria". |
| David Webb for Friends of the Shasta River | FOSR-128 | C | WR | Water Resources | | 4 | 28 | | 792 | There is no such thing in the Shasta Watershed as "excess winter runoff" in almost all years. | See MCR "PMA Selection Criteria" |
| David Webb for Friends of the Shasta River | FOSR-129 | C | WR | Water Resources | | 4 | 31 | | 931 | In essentially all years there are no excess winter and spring flows in the Shasta River given the presence of Dwinnell Res. and diversions from the Little Shasta. | See MCR "PMA Selection Criteria" |
| David Webb for Friends of the Shasta River | FOSR-130 | C | GE | Specific Edit to Plan Requested | | 4 | 31 | | 944-5 | This appendix doesn't seem to exist. | Edit Complete |
| David Webb for Friends of the Shasta River | FOSR-131 | C | GE | Specific Edit to Plan Requested | | 4 | 33 | | 1020 | This appendix doesn't seem to exist. | Edit Complete |
| David Webb for Friends of the Shasta River | FOSR-132 | C | WI | Well Logs | | 4 | 32 | | 991-97 | This information should be collected as part of a plan development project so as to be in place when needed. Existing well logs are known to be incomplete. An alternative count of production wells needs to be done, probably via securing from PP&L a count of irrigation power drops. That in turn would allow accurately assessing the level of incompleteness of the well log dataset. | The PMA "Well Inventory Program" will create a more complete well inventory. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| David Webb for Friends of the Shasta River | FOSR-133 | C | WI | Well Logs | | 4 | 34 | | 1055 ff | A project intended to generate geologically accurate well logs needs to be initiated. It could consist of paying for a qualified geologist to accompany well drillers as they drill new wells, and/or should include the drilling of dedicated wells to better characterize the subsurface geology and water bearing strata. It might be necessary to include incentive | Well drilling regulations are controlled by the state and county governments. Currently all wells are drilled by a C-57 licensed operator and must follow the standards according to the local environmental health and the state well drilling standards. The Department of Water Resources is conducting airborne electromagnetic (AEM) surveys throughout California to assist implementing SGMA in high and medium priority SGMA basins. The AEM survey may clarify some HCM data gaps. |
| Nick Joslin | MSEC-001 | B | BR | Public Trust Doctrine – Impacts to Resources | | | | | | We believe that this current document, at its heart, will fail to address ongoing impacts to the public trust resources of the Shasta Valley. This plan de-emphasizes the fact that the Shasta River is in a perilous state due to agricultural diversions of surface water and over pumping of groundwater.<br><br>The Shasta River, as is described many times in the draft document, is intimately connected to the ground water in the basin. The river is listed 303(d) impaired for both temperature and dissolved oxygen. Many past assessments have described a river system that is heavily impacted by irrigation diversion of surface water and groundwater extraction. This summer agricultural users nearly de-watered the river and one of the lowest flow events ever recorded resulted (3.5 cfs at the Yreka gage). | See MCR "Public Trust Doctrine", "ISW" |
| Nick Joslin | MSEC-002 | A | GE | GSP Insufficient | | | | | | We believe parts of this plan will serve to improperly establish baseline coverage of current practices, delay implementation of management actions, or even promote projects which could increase groundwater pumping. In doing so, the GSP seems to be designed to protect agricultural overreliance on groundwater in the Shasta River basin. | See MCR General Data Gaps |
| Nick Joslin | MSEC-003 | A | IS | ISW Depletion – Water Budget | | | | | | The GSP points towards an over reliance on future studies or future projects when it is evident that in order to consider groundwater sustainability in the Shasta Valley, one could simply consider only the agricultural water use during agricultural irrigation season. During the driest time of the year, agricultural use of interconnected surface water and groundwater vastly tips the water budget out of any semblance of sustainable. Once the irrigation season ends, groundwater recharge is rapid. | See MCR ISW |
| Nick Joslin | MSEC-004 | C | GE | Public Trust, Impacts to Environmental Beneficial Users, Role of Agriculture | | | | | | As this region has continued to experience more “very dry” years, it has become more and more apparent that there is simply not enough water during the summer months to support current agricultural users, protect the public trust resources, and maintain suitable aquatic habitat for native salmonids.<br>The county remains averse to addressing the current conditions, minimizing the evidence that agricultural groundwater use plays an increasing role in pushing the Shasta Valley further from groundwater sustainability. | Noted. |
| Nick Joslin | MSEC-005 | A | PM | PMAs, Increasing Water Use | | | | | | We assert that generic projects in the preliminary list of PMA’s aimed at “irrigation efficiency” or “flow management strategies/plans” (SHA’s) will simply allow increased water consumption and expansion of irrigated acreages. None of these theoretical projects puts more water in the river or ground; they would simply ratify extractive water uses under a banner of “beneficial” use. | Sustainable water use will require a combination of project and managment actions, as defined in Chapter 4. |
| Nick Joslin | MSEC-006 | C | DC | Environmental Justice | | | | | | This GSP does little to acknowledge the shifting considerations being made throughout state code which serve to address issues of racial and environmental justice (see SWRCB Racial Equity Initiative and the CA Fish and Game Commission working on an equity resolution and initiative). We have reached a critical moment in the evolving state regulatory structure where we must not only acknowledge the systemic tribal, racial, and environmental harms and injustices that have been propagated through land and water use laws, but we must now act to cease such harms. As such, by not addressing this, the plan will act to extend the historic “beneficial” use of water in Shasta Basin to grow food for cattle and only secondarily extend considerations to the environment or disadvantaged communities. | Noted. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nick Joslin | MSEC-007 | C | GA | Financing Cattle Industry | | | | | | With respect to developing, installing, and maintaining a modern monitoring system, we are troubled to see a shift in financing away from groundwater users and towards some notion that the whole county “benefits” from the cattle industry’s continued overreliance on groundwater extraction. | Noted. |
| Nick Joslin | MSEC-008 | C | GA | Financing- Taxes | | | | | | We do not think any taxpayers who reside outside of a specific basin should be asked to pay for any basin-specific monitoring network (tax increase). | This is a correct statement. Only groundwater users under GSA jurisdiction would be subject to any GSA related fees. |
| Nick Joslin | MSEC-009 | C | TR | Transparency-Monitoring Equipment | | | | | | We believe that all monitoring equipment paid for with taxpayer money should be available in real time to the public. | See MCR "Data System" |
| Nick Joslin | MSEC-010 | A | WI | Well Metering | | | | | | We believe that agricultural wells should be required to be metered for accuracy in reporting. | See MCR "5-year Update" |
| Salmonid Restoration Federation | SRF-001 | B | GE | Streamflow Depletion, Well Regulation | | | | | | Groundwater extraction from areas where wells can be regulated under SGMA are just one of these causes of flow depletion. Therefore, GSPs are not responsible for reversing the streamflow depletion caused by surface diversions or groundwater outside SGMA jurisdiction (e.g., wells near the mainstem Scott River, in the zone subject to surface water adjudication). However, the draft GSPs do not meet the SGMA requirements for addressing the impacts of groundwater extraction from wells inside SGMA jurisdiction. | Noted. |
| Salmonid Restoration Federation | SRF-002 | A | IS | ISW Depletion Thresholds | | | | | | SGMA requires that a GSP define minimum thresholds for streamflow depletion that cause adverse impacts on beneficial uses of the surface water, and then propose actions to ensure that such thresholds are avoided. Instead, the Scott Valley GSP does that process backwards, first defining actions that are easily achievable by groundwater users and then setting the minimum thresholds based on that. There is no consideration of the actual effects of streamflow depletion on surface water beneficial uses. This approach does not meet SGMA requirements. | This comment refers to the Scott Valley GSP and not the Shasta Valley GSP. |
| Salmonid Restoration Federation | SRF-003 | B | MN | Data Gaps, Transparency | | | | | | There is currently a lack of basic information such as the amount of groundwater extracted. Neither the Scott or Shasta GSP require metering of groundwater extraction, nor public sharing of groundwater elevation data in a form that is transparent and verifiable (i.e., sharing the actual raw data rather than summaries). Without metering and data sharing, GSP policies such as “Avoiding Significant Increase of Total Net Groundwater Use from the Basin” are illusory and easy to game. | See MCR "5-year Update" |
| Salmonid Restoration Federation | SRF-004 | A | GE | Well Metering, Construction | | | | | | In the absence of universal metering, the only other way to ensure avoiding increases in net groundwater use would be to not allow new well construction and not allow irrigation in areas not currently irrigated; however, the GSPs contain no such prohibition. | See MCR "5-year Update" |
| Shasta Headwaters | SH-001 | C | GE | Tone of GSP | | | | | | In general, the draft plan underestimates the Shasta River’s immense natural values, and it understates its historical significance to the third most productive salmon-supporting river in the contiguous western United States, and largest river restoration project in the nation/world. The plan should convey a tone of pride, honor, and duty to protect and restore the remarkable natural heritage of the Shasta River. By framing the task at hand through a solution-oriented lens, the plan should clarify that a thriving, charged, salmon-laden Shasta River is the ultimate indicator of sustainable groundwater management throughout the valley. | See MCR "GDE", "ISW", and "General Data Gaps" |
| Shasta Headwaters | SH-002 | C | WR | Specific Edit to Plan Requested: Hydrogeology | | | | 2.2.1.1. | 784 | At the end of section 2.2.1.1 after line 784, emphasize how the valley’s hydrogeology including its shallow grade, unique mineral deposits/chemical composition, and continual copious inputs of cold, clean, glacial-fed spring water made Shasta River prime salmon habitat, that historically boasted a significant majority percentage of salmon returning to spawn in the Klamath River system. | Language added. |
| Shasta Headwaters | SH-003 | C | BR | Specific Edit to Plan Requested: Broader Regulation | | | | | | Such hydrological conditions were guaranteed by consistent winter snowpack that is diminishing under current and projected warming. Please highlight how state and local water policy reform is necessary to adjust current practices to prospects of natural recharge, now and in the near future. | Language added. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Shasta Headwaters | SH-004 | B | WB | Reference to Overdraft | | | | | | During one of the GSA sub-committee meetings, I inquired that since the ground-to-surface water interconnection is established, and it's common for the Shasta River to flow at a tiny fraction of its naturally occurring volume, how can the basin not be overdrafted? The team provided a lengthy explanation that sounded like technically, the basin may not be in overdraft. But practically speaking, a month later the state issued emergency drought curtailments to irrigators throughout the basin for the first time ever. If the basin is not in a state of overdraft, while the river that defines the basin is routinely getting dewatered, perhaps we need to redefine overdraft?<br><br>I was unable to find an explanation of what constitutes overdraft in the draft plan. Please point me toward it, or include it as point of discussion/clarification . | See MCR Overdraft |
| Shasta Headwaters | SH-005 | C | PO | Public Outreach and Engagement | | | | | | The plan also underestimates the power of coordinated, widespread, voluntary conservation efforts, grassroots stewardship, and community buy-in. We urge you to include more meaningful opportunities for public interest representation, as well as Tribal leadership | Languge added in new PMA. |
| Shasta Headwaters | SH-006 | B | MN | Monitoring Network: Transparency, Accessibility | | | | | | We recommend establishing a monitoring network and making important water information available to the public | The GSA has established a monitoring network, as described in Chapter 3, however some data may need to remain private to the GSA due to privacy concerns from private well owners. |
| Shasta Headwaters | SH-007 | C | PM | Specific Edit to Plan Requested: Add Specific PMAs | | | | | | Include residential, municipal, and small agricultural water conservation education to the list of Tier I or II PMA's. | Languge added in new PMA. |
| Shasta Headwaters | SH-008 | B | PM | PMA Selection Criteria, Stakeholder Engagement | | | | | | Incorporate a mechanism for generating diverse stakeholder consensus on PMA prioritization and implementation. | Noted. Planned outreach during the implementation phase of the plan is described in Chapter 5. |
| Shasta Headwaters | SH-009 | C | GE | Specific Edit to Plan Requested | | | | | Table 1 | Include Friends of Shasta River in the Table 1 list of Shasta Valley Stakeholder Groups as an environmental organization or local NGO. | Edit Complete. |
| Shasta Headwaters | SH-010 | A | DC | Fund Tribal and NGO Participation | | | | | | Provide financial support for Tribal and/or environmental stakeholder leadership during plan implementation and maintenance. | Comment noted. Outreach activities are included in the implementation plan. |
| Shasta Headwaters | SH-011 | B | MN | Monitoring Network: Data Gaps | | | | | | In addition to bridging data gaps, we urge the GSA to pay more attention to making better use of data we do have, and synthesize the many avenues of watershed data monitoring into a comprehensive, user-friendly, consistent data management system. | See MCR "Data System" |
| Shasta Headwaters | SH-012 | B | PM | Coordinate PMA Implementation Across Subbasins | | | | | | Coordinate PMA implementation among the four basins; Shasta, Scott, Butte, Tule Lake. | PMAs will be coordinated as needed. |
| Shasta Headwaters | SH-013 | B | GE | Consolidate Resource Agencies | | | | | | Consolidate resources – combine the multiple water conservation/irrigation/service districts into one comprehensive Shasta River watershed authority. | Noted. No edit made. |
| Shasta Headwaters | SH-014 | B | MN | Coordinate Monitoring with other State and Regional Programs | | | | | | Coordinate data monitoring and plan performance between GSA's and Integrated Regional Water Management (IRWM) groups operating in Siskiyou County. Specifically, the North Coast Resource Partnership and the Upper Sacramento Regional Water Action Group (RWAG). | Data monitoring and GSP implementation will be coordinated with relevent and willing agencies. |
| Shasta Headwaters | SH-015 | C | PM | Specific Edit to Plan Requested: Add Monitoring to PMA | | | | | | In the "upslope water yield projects' category, include a mechanism for monitoring non-beneficial, industrial extraction. | See MCR "PMA Selection Criteria" |
| Shasta Headwaters | SH-016 | C | PM | Specific Edit to Plan Requested: Edit PMA | | | | | | Include incentives for switching to less water-intensive crops, and adopting regenerative agricultural practices in Tier I or Tier II PMA's | Language added to PMA "<br>Irrigation Efficiency Improvements" |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Shasta Headwaters | SH-017 | B | MN | Monitoring Unregulated Groundwater Use | | | | | | Identify periodic updates of Bulletin 118 as an opportunity to mandate monitoring of unregulated groundwater upstream. | The Shasta River groundwater basin has already undergone a revision and border expansion. The GSA only has authority within the Shasta River groundwater basin and groundwater extraction outside its authority will be addressed by the County as needed. |
| Shasta Headwaters | SH-018 | A | WR | Revise Water Rights and Management Policies | | | | | | Revisit and revise overly-complicated, fragmented, outdated, profit-motivated water management policies, and over-allocated water rights. | Noted. No edit made. |
| Shasta Headwaters | SH-019 | C | GE | Uneven Regulatory Policies | | | | | | Over-regulating small business, while under-regulating big business thereby pitting farmers against fish, while industrial users deplete dwindling supplies. | Noted. No edit made. |
| Shasta Headwaters | SH-020 | B | GE | Permitting Process | | | | | | Streamline permit processes and provide incentives for the deconstruction of impoundments that are not subject to FERC, but have outlived their useful lives . | Noted. No edit made. |
| Shasta Headwaters | SH-021 | A | PM | Awarding Grant Funds to PMAs | | | | | | GSP's should allocate a substantial percentage of SGMA grant funds to management actions that reward behavioral alternatives to wasteful water use, across sectors. | See MCR "PMA Selection Criteria" |
| Shasta Headwaters | SH-022 | C | GE | Achieving Goals of SGMA | | | | | | In order for GSA's to achieve desired results, stakeholders must do more than meter wells and monitor groundwater elevation. We must learn to appreciate ecosystem services, limit consumptive uses that primarily benefit private interests, invest downstream stakeholders in protecting supplies upstream, restore biodiversity habitat, and heed traditional ecological knowledge. | Noted. No edit made. |
| Shasta Headwaters | SH-023 | C | PO | Community buy-in | | | | | | we are concerned that without sufficient community buy-in and effective diverse stakeholder participation, GSP's will primarily serve to allocate corporate welfare to large land-owners, and continue current "regulatory" trends that broaden economic disparities and favor private over public interests. | Noted. Planned outreach during the implementation phase of the plan is described in Chapter 5. |
| National Marine Fisheries Service | NMFS-001 | B | OR | Comment Response and Summary | | | | | | We previously commented on draft Chapters 3 of the SV GSP . However, many of those comments do not appear to have been considered by the SV GSA, so we have reiterated them in this letter. In the future, we recommend the SR GSA compile a publicly available summary of comments received on the SV GSP, along with the GSA's response to each comment. | This will be done for the current group of public comments. |
| National Marine Fisheries Service | NMFS-002 | B | MN | Monitoring Network – Data Gaps | | | 16 | | Figure 1 | Page 16, Figure 1: The chosen monitoring wells are generally located too far from waterways to adequately analyze and monitor streamflow depletion. We recommend the SR GSA develop a plan for installing paired streamflow gauges and groundwater monitoring wells located in close proximity to each other. These monitoring points should be strategically located throughout the basin where potential streamflow depletion impacts are likely occurring. | See MCR Data Gaps - ISW |
| National Marine Fisheries Service | NMFS-003 | B | MN | Monitoring Network – Data Gaps | | | 25 | | 426 | Page 25, line 426: The draft GSP proposes monitoring groundwater contributions to the Shasta River during the "irrigation season", yet does not explain why monitoring is limited to this season only. Streamflow depletion does not usually occur instantaneously with the causative groundwater pumping, but can instead be delayed by days, weeks, months or years (Barlow and Leake 2012). For instance, groundwater pumping during the irrigation season could deplete streamflow when adult coho salmon are migrating in December, well after the irrigation season. To account for this temporal variability, streamflow depletion and augmentation monitoring should occur year-round. | See MCR ISW |
| National Marine Fisheries Service | NMFS-004 | B | IS | Monitoring Network – Data Gaps | | | 25 | | 439 | Page 25, line 439: The proposed protocol for monitoring interconnected surface water dynamics pairs streamflow gauging data collected at 15 minute intervals with bi-monthly surface water diversion data. The low frequency with which surface water diversion data is collected may hinder the intended analysis; we suggest gathering data on surface water diversions more frequently to alleviate this concern. | See MCR ISW |
| National Marine Fisheries Service | NMFS-005 | B | MN | Monitoring Network – Data Gaps | | | 25 | | Table 4 | Page 25, Table 4: As alluded to above, a grand total of four monitoring locations within the Shasta Valley is likely insufficient to characterize interconnected surface water dynamics. | See MCR Data Gaps - ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| National Marine Fisheries Service | NMFS-006 | B | MN | Monitoring Network – Data Gaps | | | 25 | | 449 | Page 25, line 449: Waiting until the 2032 GSP update to begin monitoring the upper Little Shasta River watershed is not appropriate, given that a 2032 start date leaves just 10 years to address streamflow depletion impacts prior to the SGMA deadline for achieving sustainable groundwater management. The SR GSA should design a plan now to gather the required data so that significant progress can be achieved at the first 5-year check-in in 2027. | See MCR ISW |
| National Marine Fisheries Service | NMFS-007 | B | GD | Groundwater Dependent Ecosystems | | | 35 | | 663 | Page 35, line 663: The draft GSP lists potential impacts resulting from streamflow depletion as diminished agricultural surface water diversions, and inadequate flows to support riparian health and ecosystems. The list should also include impacts to ESA-listed salmonids and their habitat that depend on significant groundwater accretion to maintain habitat suitability. | Edit complete. The referenced page and line number is incorrect so edits were done based on best professional judgement. |
| National Marine Fisheries Service | NMFS-008 | B | GE | Request for Clarification | | | 35 | | 676 | Page 35, line 676: Growth in groundwater demand that changes the distribution of pumping and volume pumped cannot be characterized as “unforeseen”, since the GSA is responsible for managing current and future groundwater extraction, and SGMA gives broad power to GSAs to accomplish that task. | Edit complete. The referenced page and line number is incorrect so edits were done based on best professional judgement. |
| National Marine Fisheries Service | NMFS-009 | B | GD | Environmental Beneficial Users | | | 36 | | 694 | Page 36, line 694: The draft chapter forgoes developing a groundwater/surface water analytical model as required under SGMA, and instead proposes using an analysis that uses the location, quantity and timing of interconnected surface water. The analysis focuses on the months of July through September based upon the lack of surface water input at that time of year. However, streamflow depletion impacts to beneficial uses of surface water, and specifically ESA-listed salmonids and their habitat, is not restricted to that time period. For instance, juvenile coho salmon migrate out of the Shasta River watershed during the spring months, well before July, and rearing juvenile coho salmon and steelhead inhabit the Shasta River throughout the year. Furthermore, the streamflow depletion response to groundwater pumping is not likely instantaneous, but can vary from days to months or years depending on factors such as aquifer composition, pumping depth, and other factors. NMFS recommends the SR GSA develop an integrated surface water/groundwater analytical model considering the inherent complexity of Shasta River hydrogeology. | See MCR ISW |
| National Marine Fisheries Service | NMFS-010 | B | IS | Request for Clarification | | | 36 | | 704 | Page 36, line 704: For computing groundwater contributions during the irrigation season, riparian diversions are estimated at 20 cfs throughout the growing season. However, the following sentence states that riparian diverters do not continuously divert flow. The plans approach is to use a 2/3 of the 20 cfs estimate. How was this estimate determined? | See MCR "ISW" |
| National Marine Fisheries Service | NMFS-011 | B | IS | Request for Clarification | | | 37 | | top paragraph | Page 37, top paragraph: Another uncertainty that requires acknowledgement is the sparse gauging network proposed for the “water balance” analysis. Using just two surface water gauges to characterize discharge within the groundwater basin is clearly inadequate for a number of reasons. For instance, both gauges are located on the mainstem Shasta River, with none located on tributary reaches. Also, the two existing gauges are separated by approximately 10 miles of river channel. Finally, the proposed addition of a future monitoring site (SPU on Figure 3) between the two gauges, while a worthwhile effort, does not address the lack of tributary gauges. | See MCR ISW |
| National Marine Fisheries Service | NMFS-012 | B | GD | Request for Clarification | | | 39 | | 743 | Page 39, Line 743: There appears to be no justification given as to how a minimum threshold of 100 cfs of average monthly groundwater contribution avoids significant and unreasonable impacts to surface water beneficial uses caused by groundwater pumping. NMFS recommends the SR GSA include this justification. | See MCR ISW |
| National Marine Fisheries Service | NMFS-013 | B | HM | Modeling Insufficient | | | 39 | | 754 | Page 39, line 754: As discussed earlier, focusing sustainable management criteria on the irrigation season is unlikely to adequately account for the spatial and temporal scale of groundwater/surface water interaction within the Shasta River basin. A groundwater/surface water analytical model is the appropriate tool for this type of analysis. | See MCR ISW |
| National Marine Fisheries Service | NMFS-014 | B | GE | Request for Clarification | | | | | | How is the CDFW Water Action Plan streamflow prescriptions going to be worked into the GSAs streamflow depletion SMCs?” | See MCR "ISW" |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NGO Consortium | NGO-001 | C | DC | Identification and Mapping of DACs | | | | | | The GSP states that there are five DACs in the basin, but these areas are not mapped and the population is not provided.<br><br>Provide a map of the DACs in the basin. The DWR DAC mapping tool can be used for this purpose. Include the population of each DAC in the GSP text or on the map. | One map showing DACs and SDACs has been added to Chapter 2. The population of each community is listed at the beginning of Section 2.1.1. |
| NGO Consortium | NGO-002 | C | DW | Domestic Well Mapping | | | | | | The GSP provides a map of domestic well density in Figure 4, but fails to provide depth of these wells (such as minimum well depth, average well depth, or depth range) within the basin.<br><br>Include a map showing domestic well locations and average well depth across the basin | Average depths and other information about domestic wells is provided in Appendix 3-C. |
| NGO Consortium | NGO-003 | B | DC | Mapping of DAC and groundwater users | | | | | | The GSP fails to identify the population dependent on groundwater as their source of drinking water in the basin. Specifics are not provided on how much each DAC community relies on a particular water supply (e.g., what percentage is supplied by groundwater).<br><br>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). | Added a sentence about SDAC and DAC dependence on groundwater as a source of drinking water. Details on populations in these communities are already discussed. |
| NGO Consortium | NGO-004 | A | IS | ISW Mapping | | | | | | The identification of Interconnected Surface Waters (ISWs) is insufficient, due to lack of supporting information provided for the ISW analysis. To assess ISWs, the plan relied on previous reports by Shasta Valley Resource Conservation District (SVRCD) and an on-going transect study for the Little Shasta River and Shasta River to determine the direction of flow exchange. The transect study commenced in May 2020.<br>The GSP states (p. 2-105): “The Shasta River and its major tributaries are all considered part of the interconnected surface water system in the Basin.” Figure 43 maps streams in the basin, but only shows Shasta River and Little Shasta River as being interconnected. No other data is presented in this section of the GSP, including depth-to-groundwater data and well locations. | See MCR ISW |
| NGO Consortium | NGO-005 | B | IS | Groundwater Elevation and ISW Data | | | | | | Describe available groundwater elevation data and stream flow data in the basin. ISWs are best analyzed using depth-to-groundwater data from multiple seasons and water year types (e.g., wet, dry, average, drought), to determine the range of depth and capture the variability in environmental conditions inherent in California’s climate. | See MCR ISW |
| NGO Consortium | NGO-006 | B | IS | Groundwater Contour Maps | | | | | | Overlay the stream reaches shown on Figure 43 with depth-to-groundwater contour maps to illustrate groundwater depths and the groundwater gradient near the stream reaches. Show the location of groundwater wells in the basin. | Maps have been added with groundwater gradients from 2015. Groundwater contour maps added to Appendix 2-C also have plotted rivers and streams. |
| NGO Consortium | NGO-007 | B | IS | Groundwater Contour Maps | | | | | | 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. | The recommended approach in this comment cannot be done due to existing data gaps. See MCR "General Data Gaps". |
| NGO Consortium | NGO-008 | C | IS | ISW Data Gaps | | | | | | On the stream reaches map (Figure 43), consider any segments with data gaps as potential ISWs and clearly mark them as such on the map. | Edit Complete |
| NGO Consortium | NGO-009 | B | IS | ISW Data Gaps | | | | | | Describe data gaps for the ISW analysis. Reconcile these data gaps with specific measures (shallow monitoring wells, stream gauges, and nested/clustered wells) along surface water features in the Monitoring Network section of the GSP. | See MCR Data Gaps - ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NGO Consortium | NGO-010 | A | GD | Identification of GDEs | | | | | | The identification of Groundwater Dependent Ecosystems (GDEs) is **insufficient**, due to lack of clarity around the monitoring well data (well location and screen depth) used to map groundwater elevations and depth to groundwater. The GSP references TNC Best Practices for using the NC Dataset (2019) as the approach used to map depth to groundwater, using the difference between land surface elevation and interpolated groundwater elevation above mean sea level. However, the GSP does not further describe the monitoring well data (well location and screen depth) used to create the depth-to-groundwater maps presented in Appendix 2-H. | See MCR GDE |
| NGO Consortium | NGO-011 | B | GD | Identification of GDEs | | | | | | NC dataset polygons were incorrectly removed in areas adjacent to irrigated fields due to the presence of surface water. 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 can still potentially be reliant on shallow groundwater aquifers, and therefore should not be removed solely based on their proximity to irrigated fields.<br><br>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. | See MCR GDE |
| NGO Consortium | NGO-012 | B | GD | Identification of GDEs | | | | | | NC dataset polygons were incorrectly removed based on the amount of time that they access groundwater. As presented in the GSP, assumed GDEs have access to groundwater >50% of time and assumed non-GDEs have access to groundwater <50% of the time. However, NC dataset polygons should not be assumed to be disconnected if there is any connection to groundwater (regardless of temporal percentage). Many GDEs often simultaneously rely on multiple sources of water (i.e., both groundwater and surface water), or shift their reliance on different sources on an interannual or inter-seasonal basis.<br><br>Use depth-to-groundwater data from multiple seasons and water year types to verify whether polygons in the NC Dataset are supported by groundwater, instead of the incorrect criteria mentioned above (presence of irrigation water or less than 50% time connected to groundwater). Instead of using groundwater elevation data from 2011 - 2020, we recommend the pre-SGMA baseline period of 2005 - 2015. | See MCR GDE |
| NGO Consortium | NGO-013 | B | GD | Identification of GDEs | | | | | | On the depth-to-groundwater level maps presented in Appendix 2-H, include the location of groundwater monitoring wells used to produce the maps. Discuss screening depth of monitoring wells and ensure they are monitoring the shallow principal aquifer. Change the vertical scale such that shallow groundwater elevations are presented more clearly. For example, change the largest depth on the scale to a depth of 100 or 200 feet (instead of 3000 feet). The manner in which the depths are presented make it very difficult to distinguish between depths ranging from 0-100 feet, which is the depth range pertinent to GDEs. | See Appendix 2-C for better contour maps. The GDE analysis was prelimary until data gap are filled. See MCR "GDE". |
| NGO Consortium | NGO-014 | B | WB | Water Budget-Accounting for GDEs | | | | | | The water budget did not explicitly include the current, historical, and projected demands of native vegetation. The omission of explicit water demands for native vegetation is problematic because key environmental uses of groundwater are not being accounted for as water supply decisions are made using this budget, nor will they likely be considered in project and management actions.<br><br>Quantify and present all water use sector demands in the historical, current, and projected water budgets with individual line items for each water use sector, including native vegetation. | The soil water balance in Appendix 2-I includes agricultural, native and urban water use as stated in the introduction, however, the native and urban water uses were not presented as the primary focus was on agriculture water use due to it's higher impact on groundwater. The addition of water budget plots including native, urban and agricultural water use will be considered in the GSP update for Appendix 2-I. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NGO Consortium | NGO-015 | C | WB | Identification of Wetlands | | | | | | Managed wetlands are not mentioned in the GSP, so it is not known whether or not they are present in the basin.<br><br>State whether or not there are managed wetlands in the basin. If there are, ensure that their groundwater demands are included as separate line items in the historical, current, and projected water budgets. | The GSA is unaware of any managed wetlands in Shasta Valley, per the SGMA definition. Early phases of implementation will include confirming no managed wetlands currently exist with the Basin. |
| NGO Consortium | NGO-016 | B | PO | Targeted Stakeholder Outreach | | | | | | The opportunities for public involvement and engagement are described in very general terms. They include attendance at public meetings, stakeholder email list, and updates to the GSP website. There is no specific outreach described for members of the DAC communities or domestic well owners.<br><br>In the Stakeholder Communication and Engagement Plan, describe active and targeted outreach to engage DAC members, domestic well owners, and environmental stakeholders throughout 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 | Targeted outreach was not conducted to specific DACs but a large portion of the GSP area is classified as SDAC or DAC and thus outreach to the entire basin area was intended to cover those communities. See Chapter 1 for additional information. |
| NGO Consortium | NGO-017 | B | PO | Targeted Stakeholder Outreach | | | | | | The Stakeholder Communication and Engagement Plan does not include a plan for continual opportunities for engagement through the *implementation* phase of the GSP for DACs, domestic well owners, and environmental stakeholders. | Noted. Planned outreach during the implementation phase of the plan is described in Chapter 5. |
| NGO Consortium | NGO-018 | C | GL | Groundwater Level Minimum Threshold | | | | | | For chronic lowering of groundwater levels, the GSP does not sufficiently describe or analyze direct or indirect impacts on domestic drinking water wells, DACs, or tribes when defining undesirable results.<br><br>Describe direct and indirect impacts on DACs, drinking water users, and tribes when describing undesirable results for chronic lowering of groundwater levels. | Average depths and other information about domestic wells is provided in Appendix 3-C. The entire Basin is considered a DAC or SDAC so the exisiting discussion is valid. The Karuk Tribe land in the northwestern corner of the Basin uses City of Yreka municipal water. The potential unreasonable results from reaching the groundwater level minimum threshold is presented in Appendix 3-C. The associated language in Chapter 3 has been updated with the results of the analysis. |
| NGO Consortium | NGO-019 | C | GL | Groundwater Level Minimum Threshold | | | | | | The GSP does not sufficiently describe how the existing minimum threshold groundwater levels are consistent with avoiding undesirable results in the basin.<br><br>Consider and evaluate the impacts of selected minimum thresholds and measurable objectives on DACs, drinking water users, and tribes within the basin. Further describe the impact of passing the minimum threshold for these users. For example, provide the number of domestic wells that would be de-watered at the minimum threshold. | The entire Basin is considered a DAC or SDAC so the exisiting discussion is valid. The Karuk Tribe land in the northwestern corner of the Basin uses City of Yreka municipal water. The potential unreasonable results from reaching the groundwater level minimum threshold is presented in Appendix 3-C. The associated language in Chapter 3 has been updated with the results of the new analysis. |
| NGO Consortium | NGO-020 | B | WQ | Constituents of Concern | 23 CCR §354.34(c)(4) | | | | | For degraded water quality, minimum thresholds for two constituents of concern (COCs), nitrate and specific conductivity, are set at the maximum contaminant levels (MCLs). However, the GSP does not set SMC for the other COCs in the basin (benzene, arsenic, boron, iron, manganese, and pH). The GSP states on p. 3-49 that because benzene is already being monitored and managed by the Regional Board through the Leaking Underground Storage Tank (LUST) program, SMC are not needed. The GSP states that since arsenic, boron, iron, manganese, and pH are naturally occurring, SMC are not needed. However, SMC should be established for all COCs in the basin, in addition to coordinating with water quality regulatory programs. Naturally occurring COCs can be exacerbated as a result of groundwater use or groundwater management within the basin.<br><br>Set minimum thresholds and measurable objectives for water quality constituents within the basin including naturally occurring constituents that can be exacerbated as a result of groundwater use or groundwater management. Ensure they align with drinking water standards. | See MCR Water Quality |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NGO Consortium | NGO-021 | B | WQ | Impact of Water Quality on DACs | | | 3-50 | | | To determine undesirable results for water quality, the GSP performs a statistical analysis that describes the undesirable result as follows (p. 3-50): “This quantitative measure assures that water quality remains constant and does not increase by more than 15% per year, on average over ten years, in more than 25% of wells in the monitoring network. It also assures that water quality does not exceed maximum thresholds for concentration, MT, in more than 25% of wells in the monitoring network.” The GSP does not, however, discuss impacts on drinking water users, DACs, or tribes when defining this undesirable result, such as describing how many domestic wells would be impacted by degraded water quality.<br><br>Describe direct and indirect impacts on DACs, drinking water users, 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.”<br><br>Evaluate the cumulative or indirect impacts of proposed minimum thresholds for degraded water quality on DACs, drinking water users, and tribes. | The entire Basin is considered a DAC or SDAC so the exisiting discussion is valid. The Karuk Tribe land in the northwestern corner of the Basin uses City of Yreka municipal water. The water quality minium threshold is set to the same standards as surface water quality. The potential unreasonable results from reaching the water quality minimum threshold is equivalent to violation of surface water quality standards, which is potential harm to human health. However the GSA aims to keep the Basin within the measureable objective (MO), which is to keep water quality within the historical range. Issues with water quality (ie., violations of the MO) will be coordinated between the GSA and the Regional Water Quality Control Board. PMAs might be activated. |
| NGO Consortium | NGO-022 | C | GD | Specific Edit to Plan Requested | | | 3-44 | | | The GSP states (p. 3-44): “Though SMCs for GDEs are not required by SGMA, the minimum thresholds for SV02 will be set to protect beneficial users such as GDEs and set at the Fall minimum.” The GSP further states (p. 3-45): “Based on the 7 year history of data recorded in the CASGEM system for SV02, the MT for SV02 will be set at 31 feet below ground surface for the Fall measurement.” The seven year period for which data is available is not provided in the GSP. | The data is provided in Appendix 2-C. |
| NGO Consortium | NGO-023 | B | GL | Chronic Lowering of Groundwater Level- GDEs | 23 CCR §354.26(b)(3), and §354.28(b)(4) | | | | | Furthermore, the GSP does not discuss or analyze the potential impacts to GDEs based on the proposed minimum threshold. If minimum thresholds are set to historic low groundwater levels (or lower) and the basin is allowed to operate at or close to those levels over many years, there is a risk of causing catastrophic damage to ecosystems that are more adverse than what was occurring at the height of the 2012-2016 drought. This is because California ecosystems, which are adapted to our Mediterranean climate, have some drought strategies that they can utilize to deal with short-term water stress. However, if the drought conditions are prolonged, the ecosystem can collapse.<br><br>When defining undesirable results for chronic lowering of groundwater levels, provide specifics on what biological responses (e.g., extent of habitat, growth, recruitment rates) would best characterize a significant and unreasonable impact to GDEs. Undesirable results to environmental users occur when ‘significant and unreasonable’ effects on beneficial users are caused by one of the sustainability indicators (i.e., chronic lowering of groundwater levels, degraded water quality, or depletion of interconnected surface water). Thus, potential impacts on environmental beneficial uses and users need to be considered when defining undesirable results in the basin. Defining undesirable results is the crucial first step before the minimum thresholds | See MCR Water Quality |
| NGO Consortium | NGO-024 | C | IS | ISW Depletion Minimum Threshold | | | 3-45 | | | The minimum threshold for depletion of ISW is set to 100 cubic feet per second (cfs). The GSP states (p 3-45): “Based on the limited 5-year history of measurements for the groundwater contributions SMC, a preliminary Minimum Threshold will be set at 100 CFS of average monthly groundwater contributions.” Based on discussion in the GSP, it is not clear how this value is derived and how it relates to beneficial users. | See MCR "ISW" |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NGO Consortium | NGO-025 | B | IS | ISW Depletion Minimum Threshold | 23 CCR §354.28(c)(6) | | | | | 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 basin, such as increased mortality and inability to perform key life processes (e.g., reproduction, migration).<br><br>When defining undesirable results for depletion of interconnected surface water, include a description of potential impacts on instream habitats within ISWs when defining minimum thresholds in the basin. 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 | See MCR ISW |
| NGO Consortium | NGO-026 | A | WB | Sustainable Yield | | | 2-151 | | | the GSP does not calculate a sustainable yield based on the projected water budget with climate change incorporated, but instead states that the sustainable yield will vary over time as new project and management actions are added. The GSP states (p. 2-151): “The sustainable yield is not a number that is constant over time, as future conditions may decrease or increase the amount of groundwater that can be withdrawn without causing undesirable results.”<br><br>If sustainable yield is not calculated, then there is also increased uncertainty in virtually every subsequent calculation used to plan for projects, derive measurable objectives, and set minimum thresholds. Plans that do not explicitly calculate sustainable yield may underestimate future impacts on vulnerable beneficial users of groundwater such as ecosystems, DACs, domestic well owners, and tribes.<br><br>Estimate sustainable yield based on the projected water budget with climate change incorporated, to inform the basis for development of projects and management actions. | See MCR "Sustainable Yield" |
| NGO Consortium | NGO-027 | C | PM | PMAs- Incorporate Climate Change | | | | | | Incorporate climate change scenarios into projects and management actions. | The future climate models were prepared by DWR and used in accordance with DWR guidance. |
| NGO Consortium | NGO-028 | A | MN | Monitoring Netowrk- Add Representative Monitoring Points | 23 CCR §354.34(b)(2) | | | | | The consideration of beneficial users when establishing monitoring networks is insufficient, due to lack of specific plans to increase the Representative Monitoring Points (RMPs) in the monitoring network that represent water quality conditions and shallow groundwater elevations around DACs, domestic wells, GDEs, and ISWs. 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.<br><br>The GSP does not provide specific plans, well locations shown on a map, or a timeline to fill the data gaps.<br><br>the additional RMPs should be included in the GSP now, instead of included in the 5-year GSP update. Without a map of proposed new monitoring well locations, a determination cannot be made regarding the adequacy of the monitoring network for sustainability indicators going forward into the GSP implementation phase. | Current GSP has been approved by the stakeholder committee and meets regulatory requirements. The current GSP has identified these data gaps (Appendix 3-A), PMAs to address these data gaps, and is consistent with regulations, communications by DWR, and DWR approved GSPs. In response to the public comment period, additional PMAs and language regarding data gap processes have been added to the GSP. |
| NGO Consortium | NGO-029 | B | MN | Monitoring Network- Mapping | | | | | | Provide maps that overlay current and proposed monitoring well locations with the locations of DACs, domestic wells, GDEs, and ISWs to clearly identify potentially impacted areas. | The GDE and ISW analysis are considered preliminary until identified data gaps are filled. This map will be created when data gaps are addressed. See MCR "GDE" and "ISW". |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NGO Consortium | NGO-030 | B | MN | Monitoring Network- Add Representative Monitoring Points | | | | | | Increase the number of representative monitoring points (RMPs) across the basin as needed to adequately monitor all groundwater condition indicators. Prioritize proximity to GDEs and drinking water users when identifying new RMPs. | See MCR General Data Gaps |
| NGO Consortium | NGO-031 | B | MN | Monitoring Network- Addressing Data Gaps | | | | | | Provide specific plans to fill data gaps in the monitoring network. Evaluate how the gathered data will be used to identify and map GDEs and ISWs, and identify DACs and shallow domestic well users that are vulnerable to undesirable results. | See MCR General Data Gaps |
| NGO Consortium | NGO-032 | C | MN | Using Monitoring Networks to Assess Impact to Water Users | | | | | | Further describe the biological monitoring that will be used to assess the potential for significant and unreasonable impacts to GDEs or ISWs due to groundwater conditions in the basin. Appendix 3-A mentions the use of satellite images to evaluate the health of GDEs over time, however no further details are provided in the GSP. | See MCR "GDE" and "ISW" |
| NGO Consortium | NGO-033 | B | PM | PMAs- DACs | | | | | | The consideration of beneficial users when developing projects and management actions is insufficient, due to the failure to completely identify benefits or impacts of identified projects and management actions to beneficial users of groundwater such as DACs and drinking water users.<br><br>does not discuss the manner in which DACs, drinking water users, and tribes may be benefitted or impacted by projects and management actions identified in the GSP. Therefore, potential project and management actions may not protect these beneficial users.<br><br>For DACs, domestic well owners, and tribes, 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 entire Basin is considered a DAC or SDAC so the exisiting discussion is valid. The Karuk Tribe land in the northwestern corner of the Basin uses City of Yreka municipal water. See MCR "PMA Selection Criteria". |
| NGO Consortium | NGO-034 | B | PM | Drinking Water Well Impact Mitigation Program for DACs and Domestic Well Users | | | | | | For DACs and domestic well owners, include a drinking water well impact mitigation program to proactively monitor and protect drinking water wells through GSP implementation. Refer to Attachment B for specific recommendations on how to implement a drinking water well mitigation program. | We already follow the Appendix B recommendations for a drinking water well impact mitigation program. The key elements include (Section 2 of Appendix B):<br>- Drinking water well monitoring program (see RMP for water level);<br>- Adaptive management trigger system (see water level SMC, where the MO is in the "green light" and the minimum threshold in the "yellow light" zone, for which potential corrective actions have been identified (see PMAs that address:<br>- Undertake an analysis to pinpoint the cause;<br>- Undertake water quality testing for selected domestic and public supply wells;<br>- Provide immediate support to groundwater users experiencing impacts;<br>- Reassess pumping allocation and pumping patterns;<br>- Consider restricting or limiting groundwater extraction near the impacted area.);<br>- drinking water well impact model (Appendix 3-C of GSP);<br>- public outreach and education (see PMAs);<br>- development of mitigation measures,<br>- identifying eligibility and access. |
| NGO Consortium | NGO-035 | C | PM | Multi-benefit projects | | | | | | Recharge ponds, reservoirs, and facilities for managed stormwater recharge can be designed as multiple-benefit projects to include elements that act functionally as wetlands and provide a benefit for wildlife and aquatic species. For guidance on how to integrate multi-benefit recharge projects into your GSP, refer to the “Multi-Benefit Recharge Project Methodology Guidance Document.” | See MCR "PMA Selection Criteria" |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NGO Consortium | NGO-036 | B | PM | PMAs- Incorporate Climate Change | | | | | | Develop management actions that incorporate climate and water delivery uncertainties to address future water demand and prevent future undesirable results. | The future climate models were prepared by DWR and used in accordance with DWR guidance. |
| Karuk Tribe | Karuk-001 | C | GE | References Other Comments | | | | | | The Karuk Tribe supp011s and incorporates by reference the technical comments prepared by Riverbend Sciences on behalf of the Klamath Tribal Water Quality Consortium dated September 21, 2021 regarding review and comments on Public Draft Shasta Valley Groundwater Sustainability Plan. These comments are attached. | Noted. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-001 | B | TR | Lack of Data Transparency | | | | | | How will transparency and public access to data be incorporated into reporting and data sharing agreements? All data that is paid for with public money should be accessible to the public. All GSP reporting (i.e., annual and five-year review reports) should include electronic appendices with easily accessible data, so others could run their own analyses on the data. | The GSA will follow DWR guidelines for data and model transparency. Per DWR's modeling BMP document, "final model files used for decision making in the GSP should be packaged for release to the Department". We anticipate that model files will be uploadable with the GSP in digital format. Similarly, we anticipate that DWR will collect annual report data in digital format. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-002 | B | AL | Well Metering, Lack of Data Transparency | | | | | | We understand the political sensitivity of well metering, but how can groundwater be managed at a basinwide scale without metering? At least some subset of the wells should be mandated to be metered. Examples could include the largest wells, or new wells drilled after the passage of the SGMA legislation or after adoption of the Shasta Valley GSP. How can existing ordinances, such as the prohibition on the use of groundwater for cannabis production or the requirement for permits being needed for inter-basin transfers of groundwater, be enforced without the well metering? How can the effects of efficiency projects be verified without metering? The lack of metering requirements suggests a lack of transparency, which further suggests a lack of will to actually manage groundwater extraction. | See MCR "5-year Update" |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-003 | B | BR | Water Management | | | | | | Watermastering should be returned to the State of California, with well-organized publicly accessible records of diversions. | Noted. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-004 | B | PM | GSP Terminology and Plans/Actions Inssuficiently Defined | | | | | | The GSP full of things like that sound great like the “Avoiding Significant Increase of Total Net Groundwater Use from the Basin” project and management action (PMA), but when we look closely at the details we see that the wording is loosely defined so that it does not actually guarantee anything. Since all well metering is voluntary, how is it possible to verify this?<br><br>If the GSP is to actually achieve the stated objectives, it needs more things that can actually be readily verified. Examples that we recommend include:<br><br>No additional wells for new land use or additional cropping will be permitted in the basin. Only new wells intended to replace old wells and existing crops will be permitted, and these replacement wells will be metered. The intent here is to avoid net increase in groundwater use.<br><br>Wells intended to replace stream diversions will not be permitted, even if there will be no additional net water usage (i.e., pumped groundwater will be used to replace surface water irrigation of existing crops). The intent here is to allow the SWRCB to ascertain and regulate surface water rights and stream and spring flows. The use of groundwater wells in place of stream or spring diversions simply moves the point of diversion and lessens the ability of the SWRCB to carry out its mission. | See MCR "PMA Selection Criteria" and "5-Year Update" |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-005 | B | MN | Monitoring Network – Lack of Available Funding to Implement | | | | | | We generally agree with sites and parameters proposed in Section 3.3 Monitoring Networks, but we are extremely concerned that funding will not be available to actually implement the monitoring. The GSA has a responsibility to provide the funding needed to collect these data. Without the monitoring, critical data gaps will persist and it will be impossible to understand or properly manage the intricate Shasta Valley groundwater system. | See MCR General Data Gaps |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-006 | B | IS | Modeling/Monitoring Insufficient –Interconnected Surface Waters | | | | | | The monitoring plan proposes monthly monitoring of the springs, however, this is insufficient given the importance of these springs and the potential insights that high-resolution data could provide into the complex dynamics of Shasta Valley groundwater. At what time scales do the flow of these springs fluctuate (seasonal, weekly, daily, hourly, etc.) and what do these fluctuations appear to correspond with (e.g., Dwinnell reservoir levels, nearby groundwater pumps cycling on/off, flood irrigation, snowmelt, storm events, etc.)? How can we understand this without data? The two largest springs, Big Springs and Little Springs, are especially important. Other critically important springs that need continuous flow monitoring include Bridge Field Springs (on Shasta Springs Ranch, owned by Emmerson), Black Meadow Springs (on Shasta Springs Ranch, owned by Emmerson), Kettle Springs (on Shasta Springs Ranch, owned by Emmerson), and Hole in the Ground Spring. We noticed that Bridge Field Springs and Black Meadow Springs, were not included in the monitoring plan. We strongly urge that both these springs be added to the monitoring plan. | See MCR Data Gaps - ISW |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-007 | A | IS | Minimum Threshold for IS Insufficient | | | | | | The GSP proposed a Minimum Threshold (MT) for Interconnected Surface Water (ISW) of 100 cfs groundwater contributions, based on a water balance of the Shasta River reach between Dwinnell Dam and the USGS flow gage near Montague. The estimated diversions used in the water balance are highly uncertain and unreliable, derived from private watermaster records. The bounds of uncertainty on these diversion estimates are so large as to make them nearly useless as a decision-making tool. Rather than estimating groundwater contributions based on a highly uncertain water balance, we would much rather have the MT ISW be based on the sum of measured discharges from key individual springs (i.e., Big Springs, Little Springs, Bridge Field Springs, Black Meadow Springs, Kettle Springs, and Hole in the Ground Spring). While these individual springs do not represent the entirety of the groundwater contributions (i.e., there may be some diffuse contributions as well as additional smaller springs), data on the spring flows are required anyway for management and model calibration, and should provide a more reliable relative metric of groundwater contributions than the water balance. There are not yet much data yet on these spring flows, but measurements need to begin as soon as possible. | See MCR ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-008 | B | IS | Interconnected Surface Water – GSP Does Not Account for Depletion of Surface Water Through Groundwater Pumping | | | | | | We highlight this issue because at times the GSP document seems to not acknowledge this fundamental physical reality. For example, from Chapter 3, page 46:<br><br>As explained in the previous section, the lack of historical and high-frequency groundwater elevation data in the Basin, spatial gaps in streamflow and spring measurements, and uncertainty in the historical and current data regarding surface water diversions and groundwater does not allow the development of a reliable estimate of stream depletion due to pumping. Acknowledging these uncertainties and existing data gaps, the GSA finds it inappropriate to define the interconnected surface water SMC at this stage using modeled results of stream depletion. Instead, the GSA proposes as adaptive approach that would help improve the SMC setting in the future using newly collected data while addressing SGMA requirements…<br><br>What other long-term source of water is there for the wells (see Theis, 1940, The Sources of Water Derived from Wells)? It is important to strike "…does not allow the development of a reliable estimate of stream depletion due to pumping." and replace with something like " …makes current model predictions of location and timing of impacts uncertain." | See MCR ISW |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-009 | B | HM | Modeling Insufficient – Streamflow Depletion | | | | | | A primary reason given for this is lack of data. Our comment regarding this issue (Chapter 3, page 30) is:<br><br>The text states "The goal is to use this approach for the first 5 years of implementation, collect more data, and at the GSP update provide a stream depletion approach based on more reliable results produced by the further calibrated SWGM." Two fundamental questions regarding groundwater development in the Shasta Valley are "What effect has past and present groundwater pumping had on surface-water flow in the Shasta River, tributaries, and springs in the Valley?" "What effect will future groundwater pumping have on surface-water resources in the Shasta Valley?" From the stated text, it seems that the Shasta Watershed Groundwater Model (SWGM) will not be used to answer these questions for at least 5 years. If the groundwater part of the model can be used to calculate water budget components as has already been done, why can't it be used to calculate streamflow depletions? Conversely, if the model can't be used to reliably calculate streamflow depletions, why can it be used to calculate water-budget components? Using a groundwater model, streamflow depletion from groundwater pumping is always determined using model-calculated water budget components. At this stage of development of the groundwater model, uncertainty in computed streamflow depletion will most likely be in the timing of the depletion, rather than the relative amounts that various surface-water features are affected. In five years, there will still be uncertainty in the timing of depletion, but perhaps that uncertainty will be lower. Nonetheless, a delay of five years in tackling fundamental questions seems to be ignoring the current value of the model. If key calculations were run and re-run as the model was being improved, then the modelers would learn the sensitivity of model results to changes in parameters. | See MCR ISW |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-010 | B | HM | Modeling Insufficient – Climate Change | | | | | | The GSP does include model runs for future climate change, these results are not presented in a coherent way that highlights the major challenges that climate change will pose to water management. A warming climate will cause a shift in precipitation form (less snow, more rain) that will in turn shift the seasonal timing of tributary surface flows into the valley. Regardless of what happens to total precipitation or total runoff, this change in precipitation form and runoff timing is a huge issue that water management is going to need to recon with. | See MCR Water Budgets |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-011 | C | HM | Specific Edit to Plan Requested | | 2 | 79 | 2.2.1.5 | 1500-1504 | “Streamflow data from all available sources will be further assessed during hydrologic model development to identify important critical conditions. Data quantity and quality impact both selection of data to be used for calibration and interpretation of model performance during associated time periods. More weight is given to locations and time periods with higher quality data.” This wording seems to suggest this work was not done as part of model calibration to date, but this appears incorrect, true? If so, it should be reworded in past tense. | The text was updated to properly reflect intial data assessment was completed for historical USGS streamflow gages, but as new streamflow data is being collected and as the model period is being extended to recent years more data assessment will be completed. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-012 | B | SB | Specific Edit to Plan Requested | | 2 | 87-91 | 2.2.2.2 | Figure 35-39 | Based on the values this is, indeed, a depth to water map, but then it is not an “Elevation Map” as stated. It is a bit confusing as it appears to show cones of depressions in the far eastern and western areas, but as the land is sloping it is not clear how much these values reflect changes in land surface elevation versus water groundwater surface elevation. Why not present WL elevation maps and depth to water maps separately? In the latter case, it would be good to include a more detailed land surface elevation map than that provided in Figure 6 (which is in 2,000 foot increments). | The groundwater contour maps have been updated in Chapter 2 and additional maps have been added to Appendix 2-C. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-013 | C | GE | Specific Edit to Plan Requested | | 2 | 17 | 2.2.2.6 | 2071 | This is supposed to read “south to north” not “~~north to south~~”, right? | The GSP text will be updated. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-014 | B | IS | Modeling/Monitoring Insufficient – Interconnected Surface Waters | | 2 | 108 | 2.2.2.6 | 2124-2166 | We assume these measurements will continue into the future and measurements obtained throughout the year. This is important because winter periods may prove best for understanding the ultimate degree of GS/SW interaction because of the lack of nearby irrigation pumping. In addition, a year-round analysis would provide a fuller picture of this interaction. | See MCR ISW |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-015 | C | GE | Specific Edit to Plan Requested | | 2 | 111 | 2.2.2.6 | 2128 | It is coinciding, so suggest following edit: “~~potentially coinciding~~” to “coincident”. | The exact end of the irrigation season and cessation of upstream diversions are uncertain thus the use of potentially coincidinng. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-016 | C | OR | Specific Edit to Plan Requested | | 2 | 133-134 | 2.2.2.7 | 2433, Figure 58 | Why are these maps (Figure 58 and in Appendix 2-G) so different from Figures 35-39? Is it simply a matter of scale? Suggest replacing Figures 35-39 with these figures and including WL Elevation maps separately. | The GDE analysis (Figure 58 and Appendix 2-G) used groundwater level data in a three-year rolling average while Figures 35-39 represent seasonal highs and lows in a given year. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-017 | C | GD | Specific Edit to Plan Requested | | 2 | 136-137 | 2.2.2.7 | 2506, Figure 59 | Why is this survey considered a maximum and not a minimum possible extent? There are a lot of acknowledged generalizations in this section. We would think you’d want a relatively quick field check before dismissing all the “Assumed not a GDE” areas. In addition, as noted, perched zones were not captured in the analysis. Recommend that you include something like “Representative areas currently classed as ‘Assumed not a GDE’ will be reviewed in the field as part of future work”. | Edit Complete |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-018 | B | OR | Specific Edit to Plan Requested | | 2 | 138 | 2.2.3 | Figure 60 | This graph (or an additional one) should include change in storage through time. | The water budget figures will be updated to include change in storage. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-019 | B | HM | Modeling/Monitoring – GDEs | | 2 | 138 | 2.2.3 | Figure 60 | It is important that groundwater ET be modeled explicitly in the GSFLOW model to better understand and illustrate the changes in amount and location of potential impacts to GDEs through time in areas of shallow water tables. We assume this was done. In any case, it is easy to do in MODFLOW by adding in an ET surface corresponding to ground surface with general groundwater ET extinction point rules. We assume there is a comparable simple way to do this in GSFLOW. This needs to be reported as part of the water budgets (Figures 60-61). This would be in addition to the analysis mentioned on page 141, which we don't fully understand – given groundwater ET changes as a function of WLs, how could it be calculated ahead of time and then used as input? We realize we may misunderstand this. Clarification in the text would be very useful. | Groundwater dependent ET will be included in the five year update of the model. It was not included in the current version of the model because historical groundwater levels throughout the Basin and over the entire simulation period are sufficiently deep that significant feedback to the land/soil subsystem are absent or negligible for purposes of estimating groundwater pumping. Water budgets of the annual evapotranspiration due to applied water and preciptitation can be found in Appendix 2-I. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-020 | B | AL | Pumping Allocations | | 2 | 138 | 2.2.3 | 2521-2531 | It appears that you deem domestic and public pumping to be inconsequential. We do not necessarily disagree, but an estimate of these values needs to be provided to substantiate this position. | Similar to most groundwater basins in California there was no measured groundwater pumping data of agricultural, domestic and publicy suppy uses. In the case of agriculture it has been established that applied water is a sufficient proxy for pumping estimates. [No action needed]<br><br>See General Data Gaps |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-021 | B | HM | Modeling/Monitoring – GSFLOW | | 2 | 141 | 2.2.3.1 | 2603-2609 | It is important that the GSFLOW model be used to calculate groundwater ET because the water table fluctuates through time due to changing stresses. What is the benefit to calculating this outside the model and then using it as input? | There is insufficient data on shallow groundwater dynamics to determine the depth of influence of vegetation on groundwater thus ET was calculated prior to modeling. Recent data collection of shallow groundwater transects will aid in understanding the potential draw of shallow groundwater due to vegetation and allow for inclusion of ET into the model. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-022 | C | GE | Specific Edit to Plan Requested | | 2 | 143 | 2.2.3.1 | Table 15 & 16 | Delete one of the "~~within the~~" in each, and in Table 16 we think you mean watershed boundary, not ~~Basin~~ boundary | Corrected Basin to Watershed and removed extra text of within the. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-023 | B | GE | Specific Edit to Plan Requested | | 2 | 144 | 2.2.3.1 | Table 18 | Looks like Average and Maximum values are reversed for Agricultural Pumping, or one of the values is erroneous. | The script used to create the table will be checked and the table will be updated to fix this. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-024 | C | GE | Specific Edit to Plan Requested | | 2 | 145 | 2.2.3.4 | 2695 | "Winter rains and winter/spring runoff ~~fill~~recharge the aquifer system between October and April (Figure 23)." Replace ~~fill~~ with recharge. If it filled there wouldn't be many of the issues we are dealing with here. | GSP text changed from fill to recharge to clarify the meaning, the original use of fill was meant to indicate fill as an action of putting more water in a bucket and not completely filling a bucket. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-025 | B | TR | Lack of Data Transparency | | 2 | 146 | 2.2.3.4 | 2731-2734 | "The response of the groundwater discharge to the stream system will be delayed relative to the timing of the changes in pumping or recharge – by a few days if changes occur within a few tens or hundreds of feet of a stream, by weeks to months if they occur at larger distances from the stream." This statement requires proof. Assuming delay calculations were performed for the local aquifer they should be included somewhere in the document. | The GSP will be updated to include a citation on general stream-aquifer dynamics (Theis 1941) and the text will be updated stating the assumption that the dynamics would be under the same aquifer conditions. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-026 | C | OR | Specific Edit to Plan Requested | | 2 | 151 | 2.2.4.2 | Figure 67 | “Baseline” line should be removed from graph and legend because it is confusing and same color as “Wet” | The figure was updated to remove baseline. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-027 | C | OR | Specific Edit to Plan Requested | | 2 | 151 | 2.2.4.2 | Figure 67 | “Figure 67. Projected flow at the Shasta River near Yreka gage, in difference (cfs) from Baseline, for four future projected climate change scenarios” Perhaps we are mis-understanding what these scenarios are, but are extremely skeptical of any claims that the temperature-driven changes in precipitation form due to climate change (i.e., more rain and less snow) are not going to substantially decrease river flows in summer and fall, regardless of what happens to total annual amount of precipitation. The GSP should acknowledge these realities and then describe how the model predicts that this will seasonally change river flow and groundwater. The format of the graph makes it very difficult to see meaningful seasonal patterns. The y-axis scale that ranges from -2,000 to +12,000 cfs makes it impossible to see what is happening during low flows. Can you add a second panel that to graph so that the low-flow period is legible (maybe -100 to +100 cfs?)? Or maybe limit the months to just show April through October? | The GSP includes Figure 67 to show changes in both wet season and dry season streamflows in future climate scenarios, these scenarios are based on climate change factors provided by DWR, if improved climate change factor data becomes available it will be considered for model updates. The y-axis scale on the figure ranges from -500 to 1,000 cfs not -2,000 to 12,000 cfs. The goal of Figure 67 was to indicate the general trend in streamflow between the baseline and other climate scenarios as increasing or decreasing. More detailed analysis or visualization may be done by those interested when the Shasta Valley Integrated Hydrologic Model results will be made available with the submission of the final GSP. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-028 | C | OR | Specific Edit to Plan Requested | | 2 | 151 | 2.2.5 | 2816-2818 | Delete “~~Groundwater pumping has not caused significant and unreasonable conditions in the Basin during the last 20 years~~”. The Basin has recognized problems and is a Medium Priority to the State and its why we are doing this SGMA Plan. You can say it’s not in overdraft (continuously declining WLs), but that’s it. | |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-029 | C | OR | Specific Edit to Plan Requested | | 2 | 151 | 2.2.5 | 2827 | Suggest: “…acre-feet per ~~year minus any future~~ reduction in…” to “…acre-feet per year. It may change in the future due to reduction in…” | |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-030 | B | OR | GSP Terminology and Plans/Actions Inssuficiently Defined | | 2 | 152 | 2.2.5 | 2849-2857 | It appears you are saying that the sustainable yield is less than the current value of pumping. The sustainable yield needs to be defined as part of this SGMA plan and then used as the management target. As it is currently worded in the document, there is apparently no lower limit to reductions in pumping. | See MCR Sustainable Yield |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-031 | B | OR | GSP Terminology and Plans/Actions Inssuficiently Defined | | 3 | 5 | 3.2 | 114-116 | The first sustainability goal listed is “Groundwater elevations and groundwater storage do not significantly decline below their historically measured range, protect the existing well infrastructure from outages, protect groundwater-dependent ecosystems, and avoid significant additional stream depletion due to groundwater pumping.” There is not definition of what “significant” means, so we suggest removing that word. Without a definition, isn’t this meaningless? It should probably either be percent (e.g., 1%) or volume? | See MCR "SGMA" |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-032 | B | OR | GSP Terminology and Plans/Actions Inssuficiently Defined | | 3 | 5 | 3.2 | 123 | In “Groundwater will continue to provide river baseflow as interconnected surface water with no ~~significant or unreasonable~~further reduction in volume.” strike “~~significant or unreasonable~~” and replace with “further’. Without a definition, significant is too vague. | See MCR "SGMA" |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-033 | B | MN | Monitoring Network – Lack of Available Funding to Implement | | 3 | 6-33 | | | We generally agree with sites and parameters proposed in Section 3.3 Monitoring Networks, but we are extremely concerned that funding will not be available to actually implement the monitoring. As described in our comments on Chapter 3, Section 3.3, pages 16-17, Table 1, we also recommend continuous flow monitoring of the springs, and adding two additional springs to the flow monitoring sites: Bridge Field Springs and Black Meadow Springs. | See MCR Data Gaps - ISW |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-034 | B | MN | Monitoring Network – Network Insufficient | | 3 | 16-17 | 3.3 | Table 1 | From our perspective, monitoring the flow of the springs is the most important. The output of these springs is what sustains aquatic ecosystems and agriculture in the Shasta River. In addition, the ability to predict flow in these springs is the primary endpoint upon which we will judge the performance of the Shasta Watershed Groundwater Model. We need to understand how groundwater elevations and groundwater pumping affect the flow in these springs. The monitoring plan proposes monthly monitoring of the springs, however, this is insufficient given the importance of these springs and the potential insights that high-resolution data could provide into the complex dynamics of Shasta Valley groundwater. At what time scales do the flow of these springs fluctuate (seasonal, weekly, daily, hourly, etc.) and what do these fluctuations appear to correspond with (e.g., Dwinnell reservoir levels, nearby groundwater pumps cycling on/off, flood irrigation, snowmelt, storm events, etc.)? How can we understand this without data? The two largest springs, Big Springs and Little Springs, are especially important. Other critically important springs that need continuous flow monitoring include Bridge Field Springs (on Shasta Springs Ranch, owned by Emmerson), Black Meadow Springs (on Shasta Springs Ranch, owned by Emmerson), Kettle Springs (on Shasta Springs Ranch, owned by Emmerson), and Hole in the Ground Spring.<br><br>We noticed that Bridge Field Springs and Black Meadow Springs were not included in the monitoring plan. We strongly urge that both these springs be added to the monitoring plan. | See MCR Data Gaps - ISW |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-035 | C | GE | Specific Edit to Plan Requested | | 3 | 6 | 3.3 | 155 | “A detailed discussion of potential data gaps, and strategies for resolving them, is included as Appendix 3-AZ” | Edit Complete |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-036 | B | AL | Monitoring Network – Monitoring Plan Insufficient | | 3 | 25 | 3.3.3.1 | Table 3 | Specific conductivity can readily be obtained at the wellhead using a meter. We suggest taking annually when sampling for nitrate. | Comment noted, specific conductivity will be considered for testing during future groundwater sampling. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-037 | B | GL | Well Inventory | | 3 | 28 | 3.3.4.1 | 458-472 | Suggest using WLs from “permanent” stilling well in stream and WLs from two nearby adjacent piezometers at different depths to track changes in gradients through time. | See MCR Data Gaps - ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-038 | B | OR | Specific Edit to Plan Requested | | 3 | 29 | 3.3.4.1 | Figure 6 | Should "gradient near Scott River" be changed to "gradient near Shasta River?" If you did mean this to be for the Scott River, then some discussion should be added to justify using conditions in the Scott Valley for analyses in the Shasta valley. Also, not all information is given in explaining the generation of 70 cfs of baseflow for a single water-level gradient. That gradient would have to apply to some length of the river. Is the baseflow number for the entire basin? And would one water-level gradient explain that number (70 cfs)? Normally the quantity would be given as "cfs per unit length of river," or “cfs for reach X,” where reach X has some defined length. | The figure caption has been updated. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-039 | C | OR | Specific Edit to Plan Requested | | 3 | 29 | 3.3.4.1 | Figure 6 caption | This caption seems to be for a map figure, not for the schematic cross section shown. | Edit Complete |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-040 | B | WB | Modeling Insufficient For Water Budget | | 3 | 30 | 3.3.4.1 | 490-492 | The text states “*The goal is to use this approach for the first 5 years of implementation, collect more data, and at the GSP update provide a stream depletion approach based on more reliable results produced by the further calibrated SWGM*.” Two fundamental questions regarding groundwater development in the Shasta Valley are “What effect has past and present groundwater pumping had on surface-water flow in the Shasta River, tributaries, and springs in the Valley?” “What effect will future groundwater pumping have on surface-water resources in the Shasta Valley?” From the stated text, it seems that the Shasta Watershed Groundwater Model (SWGM) will not be used to answer these questions for at least 5 years. If the groundwater part of the model can be used to calculate water budget components as has already been done, why can’t it be used to calculate streamflow depletions? Conversely, if the model can’t be used to reliably calculate streamflow depletions, why can it be used to calculate water-budget components? Using a groundwater model, streamflow depletion from groundwater pumping is always determined using model-calculated water budget components. At this stage of development of the groundwater model, uncertainty in computed streamflow depletion will most likely be in the timing of the depletion, rather than the relative amounts that various surface-water features are affected. In five years, there will still be uncertainty in the timing of depletion, but perhaps that uncertainty will be lower. Nonetheless, a delay of five years in tackling fundamental questions seems to be ignoring the current value of the model. If key calculations were run and re-run as the model was being improved, then the modelers would learn the sensitivity of model results to changes in parameters. | Sensitivity analysis is an important component of understanding the impact of parameters on model results, but for a sensitivity analysis to be useful it requires surface water and groundwater data sets with good spatial and temporal coverage, these are data gaps to be filled in the first five years, to discern how changes in model parameters impact the difference between simulated and observed values.<br>The primary difference here is that the groundwater budgets are cumulative over the entire basin and watershed which allow for averaging out of discrepancies such as uncertainty in which reaches are gaining or losing which is critical in ISW, but provides sufficient understanding of the groundwater budget to understand the respective impact of various sources and sinks.<br>Stream leakage from the aquifer to the stream occurs when groundwater levels are above the ground surface which is considered a loss from the groundwater system, if this loss did not occur to the stream leakage at a certain reach then it would result in an increase in groundwater outflow somewhere else in the domain such as near the drainage of the Shasta River from the watershed, thus there would not be a major change to the overall groundwater budget.<br>In five years there will be sufficient groundwater and surface water level data to understand what groundwater conditions are near the river to calibrate model conditions to match these which will result in spatially accurate ISW, while stream gages will allow for potentially individually calibrating the streambed conductance to better quantify the rate of streambed depletion. [No action needed] |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-041 | B | WI | Well Inventory | | 3 | 30 | 3.3.4.2 | 502-511 | Suggest incorporating the in-stream stilling well and adjacent vertical gradient piezometers as future improvements | See MCR Data Gaps - ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-042 | C | GE | Specific Edit to Plan Requested | | 3 | 30 | 3.3.4.2 | Table 5 | We are confused why the “Shasta River near Yreka (SRY)” is listed in the Table 5 “Future monitoring locations for monitoring” with the Agency listed “NA”? Isn’t that a long-term flow gage that has been operated for decades by the USGS? | Edit Complete |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-043 | B | TR | Request for Clarification | | 3 | 35 | 3.4.1.1 | 607 | “Surface diversions will be entered into the County data management system” Please describe whether or not these data will be publicly accessible. Data collected for demonstrating SGMA compliance should be publicly accessible | The GSA will follow DWR guidelines for data and model transparency. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-044 | C | GE | Specific Edit to Plan Requested | | 3 | 36 | 3.4.1.2 | 641-642 | Suggest change “the ~~historic low~~” to “<u>the historic smallest depth to groundwater”</u> | Edit Complete |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-045 | A | PM | Request for Clarification | | 3 | 36-37 | 3.4.1.2-.3 | 641 Table 6 Fig 8 | Why is MT set below historic low? This conflicts with previous statements of trying to reduce GW pumping and maintain or raise WLs (see Section 2.2.5) | The MT for groundwater levels is set slightly below the historical low to provide some buffer in the GSP to avoid breaking the MT in the first few years of plan implementation before PMAs are implemented to begin improving water levels and reduce groundwater pumping. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-046 | C | OR | Specific Edit to Plan Requested | | 3 | 37 | 3.4.1.3 | Table 6 | “AT” is not in Acronym list. | |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-047 | B | TR | Lack of Data Transparency | | 3 | 41 | 3.4.3.1 | 772-773 | It is not at all clear why municipal water users are apparently de minimis. No data have been supplied to support this claim. | The GSP text is not classifying municipal water users as de minimis users, it was stating that the GSP's PMAs would not change the operations for municipal users. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-048 | B | HM | Modeling | | 3 | 42 | 3.4.3.2 | 787-792 | “The GSA will not be using a numerical groundwater-surface water model to evaluate ISW at this time. A temporary approach based on baseflow calculation will be used.” We strongly suggest using the model in parallel with the planned approach to better understand model behavior recalibration (as you note in 3.4.3.6). | See MCR ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-049 | B | GL | Specific Edit to Plan Requested | | 3 | 43 | 3.4.3.2 | Equation table 7 | Some additional explanation would be helpful. First, mention somewhere that change in storage in the reach is assumed to be zero. We suggest changing "*SRM* is flow out of the USGS maintained SRM gage" to "*SRM* is flow at USGS maintained Shasta River near Montague (SRM) gage 11517000, located at the downstream end of the reach" A schematic with arrows for various components would help. More importantly, some sort of error analysis should be done to determine uncertainty in groundwater contributions. If an uncertainty can be estimated for each of the components of the water budgets, an analysis can be carried out to determine uncertainty in computed groundwater contributions. | See MCR "ISW" |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-050 | B | TR | Lack of Data Transparency | | 3 | 42-44 | 3.4.3.2 | 784-832 | A very important factor that does not appear to us to be mentioned in "Information and Methodology Used to Establish Minimum Thresholds and Measurable Objectives" is that there appears to be no accounting for return flows such as tailwater. If much of the irrigation along this reach of the river uses flood irrigation (i.e., in contrast to sprinklers), then isn't there a substantial quantity of tailwater that returns to the river from agricultural fields? If tailwater returns are not accounted for, then "baseflow" could be substantially overestimated in the methods described. While there are some records of tailwater quantities (i.e., from the SVRCD reports), it likely is not possible to estimate these quantities very accurately. But wouldn't it be better to at least make some educated guess about the percent of the diversions that return as tailwater (e.g., perhaps it is in the range of 10-50%) and include that in the calculation, instead of completing ignoring it? You are calling it "Groundwater Contributions" so, it should be your best estimate of groundwater. If you don't apply an adjustment for tailwater, then you should call it something else, like "Groundwater Contributions Plus Tailwater Returns," otherwise it is misleading. We do not have access to the all the reports and data sources cited in the chapter, so perhaps tailwater was indeed already accounted for and we are not aware of it, but from the descriptions provided in the GSP it appears that tailwater was ignored. | See MCR ISW |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-051 | C | OR | Specific Edit to Plan Requested | | 3 | 43 | 3.4.3.2 | 821 | We suggest changing "Riparian diverters are not measured" to "Riparian diverters are not measured, <u>despite requirements to measure and report diversions under California Senate Bill 88</u>" | The text remains unchanged because under California Senate Bill 88 requirements to measure and report diversions depends on other circumstances such as total amount diverted, water rights, and permitting. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-052 | A | PM | Specific Edit to Plan Requested | | 3 | 45 | 3.4.3.4 | 846 | The proposed Minimum Threshold (MT) for Interconnected Surface Water (ISW) is 100 cfs of groundwater contributions, based on a water balance of the Shasta River reach between Dwinnell Dam and the USGS flow gage near Montague. The estimated diversions used in the water balance are highly uncertain and unreliable, derived from private watermaster records. The bounds of uncertainty on these diversion estimates are so large as to make them nearly useless as a decision[1]making tool. Rather than estimating groundwater contributions based on a highly uncertain water balance (i.e., not the dramatic week to week fluctuations in Table 7), we would much rather have the MT ISW be based on the sum of measured discharges from key individual springs (i.e., Big Springs, Little Springs, Bridge Field Springs, Black Meadow Springs, Kettle Springs, and Hole in the Ground Spring). While these individual springs do not represent the entirety of the groundwater contributions (i.e., there may be some diffuse contributions as well as addition smaller springs), data on the spring flows are required for anyway for management and model calibration, and should provide a more reliable relative metric of groundwater contributions than the water balance. There are not yet much data yet on these spring flows, but measurements need to begin as soon as possible. | See MCR ISW |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-053 | C | OR | Specific Edit to Plan Requested | | 3 | 46-47 | 3.4.3.6 | 906-913 | What other long-term source of water is there for the wells (see Theis, 1940, The Sources of Water Derived from Wells)? It is important to strike "…~~does not allow the development of a reliable estimate of stream depletion due to pumping.~~" and replace with something like " …<u>makes current model predictions of location and timing of impacts uncertain</u>." | Edit complete |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-054 | B | PM | Request for Clarification | | 4 | 14 | 4.2 | 304 | The "Avoiding Significant Increase of Total Net Groundwater Use from the Basin" PMA does not provide a definition of what "significant" means, so we suggest removing that word. Without a definition, isn't this PMA meaningless? It should probably either be percent (e.g., 1%) or volume? See related comment regarding Chapter 4, page 19, section 4.2, line 505-508. | See MCR "SGMA" |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-055 | B | PM | Request for Clarification | | 4 | 14 | 4.2 | 326-331 | We are unable to understand exactly what the "Avoiding Significant Increase of Total Net Groundwater Use from the Basin" PMA means, especially, this excerpt: "Due to the direct relationship between net groundwater use and ET, implementation of the MA is measured by comparing the most recent five- and ten-year running averages of agricultural and urban ET over both the Basin and watershed, to the maximum value of Basin ET measured in the 2010-2020 period, within the limits of measurement uncertainty." Can it be re-stated more clearly, such as, "The goal of this MA is for X not to exceed Y by Z percent?" Can you provide information on the limits of measurement uncertainty? What is the rationale for using the maximum as the basis for the comparison? Is the purpose of the running averages to smooth out climatic variation (i.e., is ET higher in wet years than dry years)? If there is substantial variation between water year types, then should the goal be different in different water year types? What about the contribution of surface water irrigation to ET? We anticipate that climate change will cause increased reliance on groundwater because surface water flows are going to recede earlier in the irrigation season (due less snowmelt), which could result in ET staying the same but groundwater extraction will increase and flows be lower, all without violating this MA. | The GSA may choose to use Basin ET in lieu of metering wells to ensure that consumptive water use in the Basin will not rise further. When chossing ET as a measure of groundwater consumptive use, future running average ET (more recent five-year period or the most recent 10=year period) cannot exceed the maximum annual observed ET in the 2010-2020 periods. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-056 | C | GE | References Other Comments | | 4 | 15 | 4.2 | 341-343 | "To be flexible in adjusting the limit on total net groundwater extraction if and where additional groundwater resources become available due to additional recharge dedicated to later extraction." Groundwater is already over-extracted, and there is not extra water available to use in enhancing recharge. See comments on Chapter 4, Section 4.3, page 30, line 895. | If no water is available for recharge and no MAR or ILR occurs, then total net groundwater extraction would not be expanded. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-057 | C | OR | Request for Clarification | | 4 | 19 | 4.2 | 505-508 | "The permitting program would ensure that construction of new extraction wells does not significantly expand current total net groundwater use in the Basin (to the degree that such expansion may cause the occurrence of undesirable results)." How are "undesirable results" defined? Please add a definition or citation here. See related comment regarding Chapter 4, page 14, section 4.2, line 304. | Undesirable results are defined in chapter 3 |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-058 | B | AL | Request for Clarification | | 4 | 19 | 4.2 | 513-514 | "Here are two illustrative examples of an appropriate use of well replacement…" … "Example 2: Replacement of a 1,000-gpm agricultural well that will be properly decommissioned with a new 2,000-gpm capacity agricultural well is permissible with the explicit condition that the 10-year average total net groundwater extraction within the combined area serviced by the old and the new well does not exceed the average groundwater extraction over the most recent 10-years." Since groundwater use is mostly unmetered (much less publicly accessible), how would this be tracked or enforced? | The extraction could be measured with a flow meter, or by assessing changes in ET from lands that may be serviced by this well. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-059 | B | AL | Request for Clarification | | 4 | 23 | 4.2 | 659-667 | The proposed monitoring of irrigation efficiency omits a key tool– metering of water use. Without metering, how can we know if the efficiency projects are actually working? | See MCR "5-year Update" |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-060 | B | GE | Request for Clarification | | 4 | 23 | 4.2 | 659-667 | The proposed monitoring of irrigation efficiency lists “Assessment of the increase in irrigation efficiency, with particular emphasis on assessing the reduction or changes in consumptive water use (evaporation, evapotranspiration) based on equipment specification, scientific literature, or field experiments.” Doesn’t efficiency usually not affect consumptive water use but instead just change recharge (that’s how it is represented in the SVIHM, right?). What is the physical basis for thinking efficiency would affect consumptive use for crops like pasture and alfalfa that have low[1]lying continuous canopy cover (i.e., in contrast to orchards or row crops like tomatoes where efficient delivery systems like drip irrigation could reduce evaporation from bare soil)? | This comment refers to the Scott Valley groundwater basin numerical model, when these comments are for the Shasta Valley Basin. However, the irrigation efficiency PMA has been updated for clarity to address this comment. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-061 | B | GL | Groundwater Level Improvement Plan Insufficient | | 4 | 25 | 4.2 | 668 | “Juniper Removal: The GSA, USGS and other agencies and private stakeholders will remove excess juniper within the watershed to improve groundwater levels.” While it is conceptually possible to increase water yield for some number of years following juniper removal, it is difficult to actually implement at a watershed scale and maintain it over time. Furthermore, juniper removal will not necessarily increase water yield in all climates, so local conditions should be evaluated (Niemeyer et al. 2017). Such projects should be considered within a holistic management framework that re-establishes historical fire regimes and does not focus solely on water yield. Maintenance would be needed because the benefits of one-time removal projects are likely to be short-lived (Fogarty et al. 2021). References: Fogarty, D. T., de Vries, C., Bielski, C., & Twidwell, D. (2021). Rapid Re-encroachment by Juniperus virginiana After a Single Restoration Treatment. Rangeland Ecology & Management, 78, 112–116. https://doi.org/10.1016/j.rama.2021.06.002. Niemeyer, R. J., Link, T. E., Heinse, R., & Seyfried, M. S. (2017). Climate moderates potential shifts in streamflow from changes in pinyon-juniper woodland cover across the western U.S. Hydrological Processes, 31(20), 3489–3503. https://doi.org/10.1002/hyp.11264 | Added the recommended text and references. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-062 | A | PM | Alternative PMA Suggested | | 4 | 30 | 4.3 | 895 | Given that there is already a dam in place that captures winter runoff from the upper Shasta River watershed, we oppose the Managed Aquifer Recharge (MAR) or In-Lieu Recharge (ILR) PMA. Dwinnell Dam already reduces winter and spring flows enough that there are not sufficient high flows to maintain natural geomorphic processes in the Shasta River. There is no “extra” water in the Shasta River that can be used to recharge groundwater. The way to improve groundwater conditions is demand reduction. | For the MAR and ILR PMA, the GSA will conduct a pilot study and discuss with the SWRCB regarding the diversion of water to evaluate the sustainabiltiy of water diversion. See MCR "PMA Selection Criteria". |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-063 | C | GE | Projects and Management Actons | | 4 | 32 | 4.3 | 954 | We support the Strategic Groundwater Pumping Curtailment PMA. | Noted. See MCR "PMA Selection Criteria". |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-064 | | GE | Modeling | | App 2-E | 10 | | | We did not receive this appendix with the model documentation until September 13, so did not have time to review it in detail. Many sections of it appear to only be partially complete. We look forward to reviewing this when it is complete. | Model documentation is included in Appendix 2-E. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-065 | B | OR | Request for Clarification | | App 2-I | 8 | | | How do the total evapotranspiration of applied water (ETaw) and precipitation (ETpr) values calculated in this report compare with previous estimates such as from CDWR Land and Water Use Estimates (https://water.ca.gov/Programs/Water-Use-And-Efficiency/Land-And-Water[1]Use/Agricultural-Land-And-Water-Use-Estimates), and/or the remote-sensing based Baldocchi et al. (2019)? Full citation: Baldocchi, D., Dralle, D., Jiang, C., & Ryu, Y. (2019). How Much Water Is Evaporated Across California? A Multiyear Assessment Using a Biophysical Model Forced With Satellite Remote Sensing Data. Water Resources Research, 55(4), 2722–2741. https://doi.org/10.1029/2018WR023884 | Thank you for this comment. The estimates of total evapotranspiration of applied water and precipitation were developed using best professional practices and sources of information cited in Appendix 2-I (Section 3), but a direct comparison to the other two sources of information cited here has not been completed at this time. This comparison will be taken into consideration for revisions for the final GSP and during GSP implementation, as each may provide a helpful point of reference and potential opportunity for improving estimates of evapotranspiration within the Basin. |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-066 | B | OR | Request for Clarification | | App 3-A | 10 | | Table 2 | Why are flow gages not listed in the Table 2 Data Gap Prioritization? Shouldn't measuring the flow rates of the largest springs (i.e., Big Springs, Little Springs, etc.) be the highest priority? We do not understand how it will be possible to calibrate groundwater model without having data for these springs. | See MCR Data Gaps - ISW |
| Riverbend Sciences on behalf of Tribes of the Klamath Tribal Water Quality Consortium | TC-067 | B | OR | Request for Clarification | | App 3-A | 11 | | Table 2 | The groundwater extraction row of Table 2 says "No strategy has been defined yet to fill this data gap. Only voluntary measures are being considered to gathered extraction data." This is disappointing. How can groundwater be effectively managed without data about how much groundwater is being pumped? | See MCR General Data Gaps |
| Quartz Valley Indian Community | QVIC-001 | B | PM | PMAs For Instream Flows Insufficient | | | | | | However, we are disappointed that the GSP did not propose more ambitious steps towards addressing the critical lack of instream flows in the river during summer and fall. | See MCR "ISW" |
| Quartz Valley Indian Community | QVIC-002 | B | HM | Modeling Insufficient | | | | | | The technical review has revealed a concerning weakness in the model, particularly in October and November when the groundwater basin is transitioning between draining and filling, those details are included herein. This is most concerning to the Tribe since this is when our salmon are in the Scott system trying to access as much habitat as possible to spawn. We feel that these modeling weaknesses<br>could be refined and alleviated through a more robust monitoring program throughout the valley. | See MCR Data Gaps - ISW |
| Quartz Valley Indian Community | QVIC-003 | C | GE | References Other Comments | | | | | | We have also attached a Technical Memorandum developed by our consultants on the Shasta GSP. Many of the same legal questions apply to the Shasta GSP as well. Although QVIC staff were focused on the Scott GSP development, the Tribe has ancestral lands in the Shasta basin and development of a solid GSP is just as important there as in the Scott River basin to QVJC membership. | Noted. |

**SHASTA VALLEY GROUNDWATER SUSTAINABILITY PLAN**
**PUBLIC COMMENT SUMMARY – MULTIPLE COMMENT RESPONSE**

November 2021

## Multiple Comment Response Directory Table

| ID | Multiple Comment Response |
|---|---|
| **ISW** | Clarifying text has been added to Section 3.4.3.2., where the GSP identifies and describes an effective method for quantifying streamflow depletion on calculating Baseflow contribution. The methodology is used in lieu of an integrated hydrologic model, which is currently under development. In the interim, groundwater contributions to baseflow are held at historic levels to avoid new undesirable results.<br><br>SGMA defines that depletion of ISW (354.16) is based on groundwater conditions occurring throughout the basin and not explicitly groundwater extraction or use. The GSP sets the minimum threshold (MT) based on the calculated baseflow contributions from groundwater which is a function of groundwater conditions in the basin. However, the Basin is expected to operate above the measurable objective (MO) at 145 CFS; the difference between the MO and MT is and should be treated as an operational buffer zone to prevent the Basin from approaching the MT. At this time a preliminary Minimum Threshold of 100 cfs of baseflow has been chosen by looking at the typical baseflow under recent conditions, which is limited by a short historical record that lacks sufficient drought year representation. The MT is set at 100 cfs and not higher (closer to 150 cfs in some years) to account for the lack of baseflow data during drought years that would result in lower baseflow contribution. This will prevent the MT from being passed under current conditions in a drought year. The Minimum Threshold may increase pending further discussion with the Watermaster and analysis of new groundwater and surface water monitoring data under a greater variety of water year types. This analysis can be completed prior to the scheduled 5-year GSP update, if new data from 2019-2021 is obtained. The GSA plans to collaborate with CDFW to develop in-stream flow requirements with the SWRCB to better protect environmental beneficial users.<br><br>Fundamentally, the GSA currently lacks sufficient groundwater and surface water monitoring data and models to identify depletion of surface water specifically from groundwater pumping and appropriately calibrate the model. At this time there is insufficient groundwater and surface water monitoring data to distinguish what baseflow contribution occurs during periods of influence from groundwater pumping and what baseflow occurs during periods of no influence from groundwater pumping, however, baseflow is still a direct measure of ISW. The numerical groundwater-surface water model cannot be used for this calculation until the identified data gaps are filled. After the data gaps are addressed, the model can be calibrated to properly represent the flow exchange and evaluate groundwater contributions during the entire year.<br><br>The focus of the 2027 GSP update is to address data gaps related to the Big Springs Complex, and the focus of the following GSP update will be the Little Shasta River and other Shasta River tributaries, dependent on funding. The UC Davis Center for Watershed Sciences (CWS) is in the process of developing an |

| ID | Multiple Comment Response |
|---|---|
| | in-stream flow assessment of the Little Shasta River (LSR) and have been sharing information that will support the GSP in eventually creating ISW criteria for the LSR as currently there is insufficient data to quantify streamflow depletions or more specifically streamflow depletions due to groundwater extraction.<br><br>Due to these data gaps, the GSP also does not have detailed interim milestones for the ISW SMC. These will be developed during first five-year implementation period as additional data become available and the integrated hydrologic model becomes available for developing a more specific ISW SMC, including interim milestones. This may also include determining which reaches that could benefit from reduction in pumping or recharge projects during critical times of the year.<br><br>The GSA acknowledges the data gaps in the ISW analysis in Section 2.2.2.6, outlines how to address them in Appendix 3-A, and discusses the implementation plan in Chapter 5. Additional text has been added to Section 2.2.2.6 and Appendix 3-A for clarity and an additional management action "Interconnected Surface Water Data Gaps" has been added to Chapter 4. A more detailed implementation for PMAs and data gaps has been added to Chapter 5. The GSA looks forward to working with CDFW and other relevant agencies to fill these data gaps of ISWs in Shasta Valley in the next 5 years for the next GSP update. |
| **GDE** | Section 2.2.2.7 lists all the protected species in Shasta Valley. The section provides Table 2.6, which lists all freshwater species with any federal and state level status, from endangered to watch list. This list of observed species within the Butte Valley groundwater basin was collected from the California Department of Fish and Wildlife (CDFW) Biogeographic Information and Observation System (BIOS) Viewer. Describing potential impacts on GDEs requires a better understanding of the location and nature of GDEs in the Basin. The location of species within the Basin requires local confirmation and fine-tuning of general online maps. The GDE monitoring network must be expanded; SV02 is currently the best and only groundwater well to monitor any subset of GDEs.<br><br>The aim of the GSP is to protect existing GDEs. By setting the water level SMCs such that water level conditions during the baseline period (1991-2014) are preserved, these existing GDEs are sufficiently protected. Representative areas currently classed as 'Assumed not a GDE' will be reviewed in the field as part of future work and reanalyzed as data gaps are filled.<br><br>The GSA acknowledges the data gaps in the GDE analysis in Section 2.2.2.7 and outlines how to address them in Appendix 3-A and Chapter 5. Additional text has been added to Section 2.2.2.7 and Appendix 3-A for clarity and an additional management action "Groundwater Dependent Ecosystem Data Gaps" has been added to Chapter 4. The GSA looks forward to working with |

| ID | Multiple Comment Response |
|---|---|
| | CDFW and other agencies to fill these data gaps of local habitat in Shasta Valley in the next 5 years for the next GSP update. |
| **Water Budgets** | A table with the data shown in Figures 60 and 61 in Chapter 2 is now included, presenting the historic groundwater basin and watershed water budgets. Tables 13-18 in Chapter 2 present summary statistics for the water budget, computed with SWGM. The model is currently calibrated for the period from 1990 to 2018 using twice annual water level data from DWR's CASGEM database plus local monthly data provided by The Nature Conservancy for few locations in the Basin.<br><br>With new continuous water level monitoring now in place since 2019, and with additional data collection efforts to address data gaps identified in the GSP, future model calibration will provide the basis for improving the representation of the groundwater-surface water interface in the model, including canal leakage, lake seepage, and surface water depletion due to groundwater pumping.<br><br>The future climate models were prepared by DWR and used in accordance with DWR guidance. |
| **HCM** | The entire Basin is considered one principal aquifer, with sub aquifers or water bearing formations reflected in the parametrization of the model. Text has been modified to make this clearer. Groundwater elevation maps are included in Section 2.2.2. Aquifer parameters are described in Chapter 2.2 and documentation of the Shasta Watershed Groundwater Model (SWGM) in Appendix 2-E.<br><br>For purposes of the GSP, a representative groundwater monitoring program was developed across multiple water bearing formations, representative of the varied geology across the basin. The network encompasses both, alluvial formations and volcanic formations. Data do not currently exist to distinguish water level conditions in multiple overlying geologic units. Future nested piezometer well development should help determine vertical gradients between aquifers. The geologic model, based on well logs, defined different hydrogeologic formations. These were assigned appropriate hydraulic parameters based on geologic properties and further adjusted with model calibration.<br><br>Unlike alluvial basins elsewhere in California, the principle aquifer in Shasta Valley is not the alluvium; rather it is a combination of the alluvium, volcanic debris and lava flows. A definable base is not presented in the HCM because a clear spatial definition of the contact between alluvium, volcanics, and bedrock is not available, especially where volcanic rocks are very thick.<br><br>It is possible to calculate the approximate storage in the principle aquifer using groundwater elevation, expected (range of) values for formation specific yield, and formation thicknesses, but given the large uncertainty about the thickness |

| ID | Multiple Comment Response |
|---|---|
| | of the volcanics, our focus is on changes in groundwater storage rather than total groundwater storage.<br>We note that water bearing formations may have variable yields throughout the basin due to changes in geologic structure, preferential flow paths (e.g. fractures), and groundwater conditions. |
| **Data Gaps - ISW** | SMCs for ISWs will be revisited during the next 5-year GSP update. The GSA acknowledges the data gaps in the ISW analysis in Section 2.2.2.6, outlines how to address them in Appendix 3-A, and discusses the implementation plan in Chapter 5. Additional text has been added to Section 2.2.2.6 and Appendix 3-A for clarify and an additional management action "Interconnected Surface Water Data Gaps" has been added to Chapter 4. A more detailed implementation for PMAs and data gaps has been added to Chapter 5. The GSA looks forward to working with CDFW and other relevant agencies to fill these data gaps of ISWs in Shasta Valley in the next 5 years for the next GSP update. |
| **Data Gaps - GDE** | See MCR GDE |
| **Opinion** | Noted. |
| **Water Quality** | The GSA only sets SMCs for two COCs but will continue to monitor other identified COCs for any increasing temporal and spatial trends. As shown in Appendix 2-B, benzene contamination is highly localized and is monitored and managed by the Regional Board through the Leaking Underground Storage Tank (LUST) program. The GSA feels that SMCs are not needed at this time for benzene but will continue to monitor trends. The GSA feels that an SMC is not needed for naturally occurring arsenic, boron, iron, manganese, and pH, but will continue to monitor the constituents for any future issues. |
| **Public Trust** | Case law does not support the assertion that the Public Trust Doctrine (PTD) requires a GSA generally, or a special act district acting in such capacity, to take specific actions with respect to public trust resources in the context of developing a GSP. Therefore, the consensus building of the Advisory Committee (AC) is a legitimate means of specifying an approach to considering the PTD, where the AC - consisting of a wide range of stakeholders - considered this MT to be a workable compromise between local economic interests, tribal interests, and environmental needs.<br><br>The GSA operates under the SGMA and its associated regulations. SGMA clearly outlines a staged process to full compliance with the sustainability criteria by 2042. Furthermore, an extended implementation period for actions to protect public trust resources is not unprecedented: Several decades separate the Mono Lake court decision (National Audubon Society v. Superior Court (Supreme Court of California, 1983, 33 Cal.3d 419) from achieving its management (i.e., sustainability) goal, which has yet to be reached (https://www.monolake.org/learn/stateofthelake/).<br><br>A short section on the PTD has been added to Chapter 2 - Section 2.1.2.6. |

**SHASTA VALLEY GROUNDWATER SUSTAINABILITY PLAN**
**PUBLIC COMMENT SUMMARY – MULTIPLE COMMENT RESPONSE**

November 2021

| ID | Multiple Comment Response |
|---|---|
| **General Data Gaps** | The GSA acknowledges existing data gaps in Chapter 3 and Appendix 3-A, proposes PMAs in Chapter 4, and discusses an implementation plan in Chapter 5. General data gaps include water levels from domestic wells and groundwater extraction. Based on existing and available data, the GSP contains an accurate water budget, clearly defined sustainable management criteria, including minimum thresholds. The GSP will be updated as needed when data gaps are filled but will be dependent on outside sources of funding.<br><br>The current data gap in groundwater extraction does not limit effective groundwater management as estimating groundwater extraction based on land use is sufficient to quantify basin groundwater budgets that determine groundwater sustainability for the basin. Future voluntary collection of groundwater extraction will serve for modeled groundwater pumping validation and verification of the success of PMAs. |
| **Overdraft** | As defined in Bulletin 118, overdraft refers to a long-term trend in groundwater storage, not to short-term fluctuations in water levels that may seasonally lead to some undesirable results. |
| **Sustainable Yield** | The GSP is more conservative than a specific sustainable yield. Sustainable yield is a function of future climate and of project implementation. It may be less in the future than it is currently. The sustainable yield selected by the GSP is a formula that accounts for such changes. Prescribing a fixed sustainable yield is technically incorrect and practically insufficient to achieve long-term sustainability. The starting value of the sustainable yield is focused on the historic average of groundwater pumping which will translate into looking at the future averages of annual groundwater pumping rather than specific years.<br><br>The undesirable results are prevented through the minimum threshold. The minimum threshold will be reached by implementation of PMAs that achieve the required level of reversal in streamflow depletion. To the degree that those PMAs require a future reduction in groundwater pumping, that amount of pump reduction must be subtracted from the sustainable yield, which was computed for the pre-2015 baseline period. By providing a definition of sustainable yield that is not a fixed number, but accounts for future PMAs in a well-prescribed protocol, the sustainable yield is specific and implicitly adjusts to the implementation of PMAs. The GSP's definition of sustainable yield avoids the possibility that a new pumper will claim the amount of pumping that was retired through a PMA elsewhere in the basin. This also provides for managed or in lieu aquifer recharge to not be added to the sustainable yield of the basin if that recharge is explicitly dedicated to the reversal of stream depletion. The approach is consistent with that, e.g., in overdrafted basins, where the sustainable yield, in some basins, is defined as the sustainable yield during the base period plus any future increases in managed aquifer recharge (a PMA). |
| **Groundwater Storage** | **Moved to HCM** |
| **PMA Selection Criteria** | Chapter 5 outlines how PMAs will be selected for prioritization during GSP implementation. Text has been added to Chapter 4.1 and Chapter 5 implementation schedule. After GSP adoption, the GSA will prioritize certain |

| ID | Multiple Comment Response |
|---|---|
| | PMAs for feasibility reviews and preliminary engineering studies. Based on review and study results, PMAs may move forward to implementation. |
| **SGMA** | The terms are part of SGMA language. The definitions of unreasonable results are explained in Chapter 3 for the different sustainability indicators. |
| **5-year Update** | At this time, the GSA has elected to use a voluntary program for groundwater extraction reporting. For the next five years, the GSA will conduct public outreach to encourage voluntary participation. This may be revisited in the 5-year update. Siskiyou County is currently considering a revised well drilling permit. |
| **Surface Water Temperature** | CCR 354.28(c)(4) explicitly refers to "contaminant plumes" and "supply wells", indicating that groundwater quality must be monitored ("Degraded Water Quality. The minimum threshold for degraded water quality shall be the degradation of water quality, including the migration of contaminant plumes that impair water supplies or other indicator of water quality as determined by the Agency that may lead to undesirable results. The minimum threshold shall be based on the number of supply wells, a volume of water, or a location of an isocontour that exceeds concentrations of constituents determined by the Agency to be of concern for the basin. In setting minimum thresholds for degraded water quality, the Agency shall consider local, state, and federal water quality standards applicable to the basin."). Furthermore, in interpreting this regulation, DWR's BMP 6 guidelines (https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Sustainable-Groundwater-Management/Best-Management-Practices-and-Guidance-Documents/Files/BMP-6-Sustainable-Management-Criteria-DRAFT_ay_19.pdf) provide no indication that surface water quality monitoring is required where and when baseflow conditions occur. With respect to surface water temperature, it is described as an undesirable result associated with low groundwater levels and storage, and insufficient baseflow. |
| **Emergency Regulations** | The SWRCB regulations at 23 CCR 875 et seq. identify "emergency minimum flows" and authorize the Division of Water Rights to curtail diversions where necessary to ensure Shasta River flows are not reduced below the emergency minimum flows. In this regard, the emergency minimum flows serve as a target to guide the Division of Water Rights in determining whether to curtail diversions. These minimum flows do not apply outside this context such that local water use, and planning decisions must attempt to achieve the emergency minimum flows. Further, SWRCB's action only pertains to extremely dry years and/or is anchored in a governor's drought emergency declaration. Some language on this topic has been added to Chapter 2. |
| **References** | This topic is already discussed in Chapter 2, based on existing scientific data. Additional statements must be supported by scientific references and documented data. If relevant references are missing from the GSP, please submit to the GSA during the next GSP update. |
| **Well Outtage Appendix** | A well outage analysis has been added to the GSP, in Appendix 3-C. |

**SHASTA VALLEY GROUNDWATER SUSTAINABILITY PLAN**
**PUBLIC COMMENT SUMMARY – MULTIPLE COMMENT RESPONSE**

November 2021

| ID | Multiple Comment Response |
|---|---|
| **Data System** | The GSA will follow DWR guidelines for data and model transparency. Per DWR's modeling BMP document, "final model files used for decision making in the GSP should be packaged for release to the Department". We anticipate that model files will be unloadable with the GSP in digital format. Similarly, we anticipate that DWR will collect annual report data in digital format. |

Table Key:
AC = Advisory Committee
BMP = best management practice
CASGEM = California Statewide Groundwater Elevation Monitoring Program
CDFW = California Department of Fish and Wildlife
COC = Water Quality Constituent of Concern
DWR = Department of Water Resources
GDE = Groundwater Dependent Ecosystem
GSA = Groundwater Sustainability Agency
GSP = Groundwater Sustainability Plan
HCM = Hydrologic Conceptual Model
ISW = Interconnected Surface Water
MT = Minimum Threshold
PMA = Project and Management Action
PTD = Public Trust Doctrine
SGMA= Sustainable Groundwater Management ACt
SMC = Sustainable Management Criteria
SWGM = Shasta Watershed Groundwater Model
SWRCB = State Water Resource Control Board