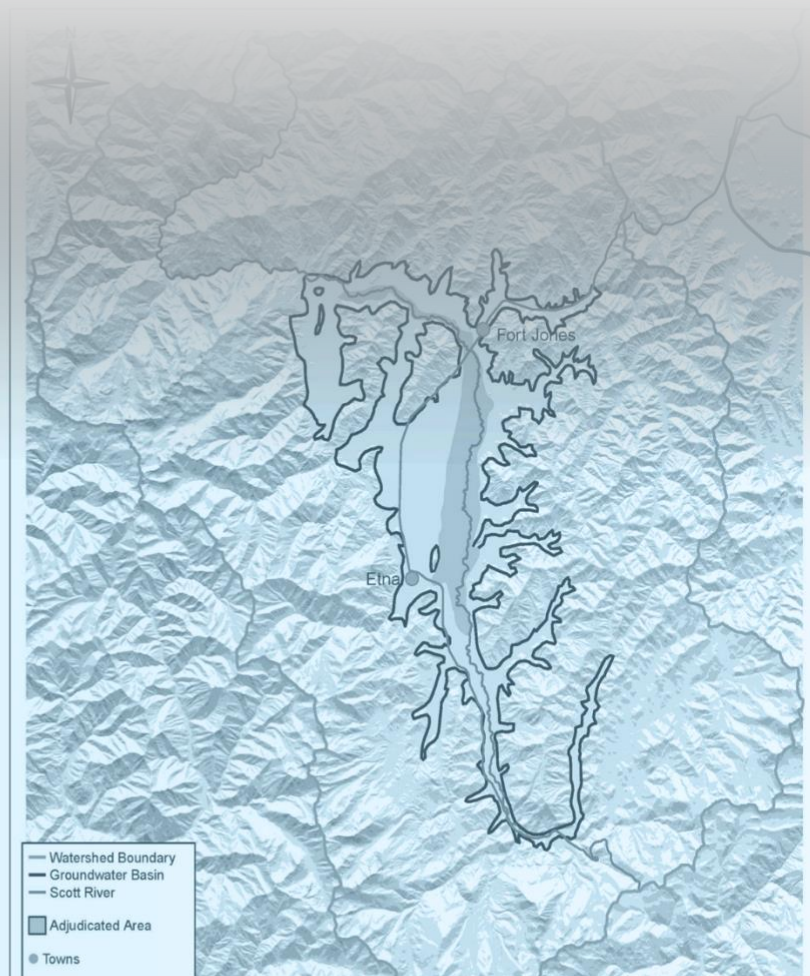
DECEMBER 2021

EXECUTIVE SUMMARY

## SISKIYOU COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

# Scott Valley Groundwater Sustainability Plan

FINAL DRAFT REPORT



# SISKIYOU COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT GROUNDWATER SUSTAINABILITY AGENCY SCOTT RIVER VALLEY GROUNDWATER SUSTAINABILITY PLAN

## BOARD

Brandon Criss, County of Siskiyou
Ed Valenzuela, County of Siskiyou
Michael Kobseff, County of Siskiyou
Nancy Ogren, County of Siskiyou
Ray A. Haupt, County of Siskiyou

## STAFF

Matt Parker, Natural Resources Specialist, County of Siskiyou

## TECHNICAL TEAM

Laura Foglia, LWA
Thomas Harter, UC Davis

Andrew Calderwood, UC Davis
Brad Gooch, UC Davis
Cab Esposito, LWA
Katrina Arredondo, LWA
Kelsey McNeill, LWA
Claire Kouba, UC Davis
Bill Rice, UC Davis

## ADVISORY COMMITTEE

Andrew Braugh, Environmental/Conservation
Brandon Fawaz, Private Pumper
Crystal Robinson, Tribal Representative
Jason Finley, Private Pumper
Michael Stapleton, Residential
Paul Sweezey, Member-at-large
Tom Jopson, Private Pumper
Tom Menne, Scott Valley Irrigation District
Bill Beckwith, City/Municipal

Suggested Citation: Siskiyou County Flood Control and Water District Groundwater Sustainability Agency, Scott River Valley Groundwater Sustainability Plan (Public Draft), December 2021, https://www.co.siskiyou.ca.us/naturalresources/page/sustainable-groundwater-management-act-sgma

# Contents

# Executive Summary

## ES-1: INTRODUCTION (CHAPTER 1)

### Background (Section 1.1)

*Section 1 describes the Sustainable Groundwater Management Act and the purpose of the Groundwater Sustainability Plan. Section 1 also introduces the management structure of the agencies developing and implementing the GSP.*

The 2014 Sustainable Groundwater Management Act (SGMA) was established to provide local and regional agencies the authority to sustainably manage groundwater resources through the development and implementation of GSPs for high and medium priority subbasins (e.g., Scott Valley). In accordance with SGMA, this GSP was developed and will be implemented by the Siskiyou County Flood Control and Water Conservation District, the GSA representing the Basin.

The California Department of Water Resources (DWR) and the State Water Resources Control Board (State Board) provide primary oversight for implementation of SGMA. DWR adopted regulations that specify the components and evaluation criteria for groundwater sustainability plans, alternatives to Groundwater Sustainability Plans (GSPs), and coordination agreements to implement such plans. To satisfy the requirements of SGMA, local agencies must do the following:

- Locally controlled and governed Groundwater Sustainability Agencies (GSAs) must be formed for all high- and medium-priority groundwater basins in California.
- GSAs must develop and implement GSPs or Alternatives to GSPs that define a roadmap for how groundwater basins will reach long-term sustainability.
- The GSPs must consider six sustainability indicators defined as: groundwater level decline, groundwater storage reduction, seawater intrusion, water quality degradation, land subsidence, and surface-water depletion.
- GSAs must submit annual reports to DWR each April 1 following adoption of a GSP.
- Groundwater basins should reach sustainability within 20 years of implementing their GSPs.

This GSP was prepared to meet the regulatory requirements established by DWR, as shown in the completed GSP Elements Guide, provided in Appendix 1-D, which is organized according to the California Code of Regulation Sections of the GSP Emergency Regulations.

**Purpose of the Groundwater Sustainability Plan**

The Scott Valley GSP outlines a 20-year plan to direct sustainable groundwater management activities that considers the needs of all users in the Basin and ensures a viable groundwater resource for beneficial use by agricultural, residential, industrial, municipal and ecological users. The initial GSP is a starting point towards achievement of the sustainability goal for the Basin. Although available information and monitoring data have been evaluated throughout the GSP to set sustainable management criteria and define projects and management actions, there are gaps in knowledge and additional monitoring requirements. Information gained in the first five years of plan implementation, and through the planned monitoring network expansions, will be used to further refine the strategy outlined in this draft of the GSP. The GSA will work towards implementation of the GSP to meet all provisions of SGMA and will utilize available local resources, and resources from State and Federal agencies to achieve this. It is anticipated that coordination with other agencies that conduct monitoring and/or management activities will occur throughout GSP implementation to fund and conduct this important work. Additional funding required may be achieved through fees, or other means, to support progress towards compliance with SGMA.

# ES-2: PLAN AREA AND BASIN SETTING (CHAPTER 2)

*Chapter 2 provides an overview of the Scott Valley Basin. This includes descriptions of plan area, relevant agencies and programs, groundwater conditions, water quality, interconnected surface waters, and groundwater-dependent ecosystems. These details inform the hydrogeologic conceptual model and water budget developed for the Basin which will be used to frame the discussion for sustainable management criteria (Chapter 3) and projects and management actions (Chapter 4).*

## Description of Plan Area (Section 2.1)

### *Summary of Jurisdictional Areas and Other Features (Section 2.1.1)*

The Scott Valley Basin (the Basin) is a medium priority basin located in Northern California. The Basin is surrounded by several mountain ranges that are drained by the Scott River and its tributaries. Two areas in the Basin are exempt from SGMA requirements to form GSA's or develop GSPs; the interconnected zone adjudicated in 1980, through Decree No. 30662, and the Quartz Valley Indian Reservation. Irrigated agriculture is a primary land use in the Basin, largely pasture and alfalfa. The primary communities in Scott Valley are the cities of Etna and Fort Jones and the community of Greenview, all of which fall within the categories of Severely Disadvantaged Communities (SDACs) or disadvantaged communities (DACs) based on annual median household income. The population of the Basin (including towns and residents of unincorporated areas) was approximately 8,000 in the 2000 census (SRWC and Siskiyou RCD, 2005).

### *Chronology of Groundwater Management in Scott Valley (Section 2.1.2)*

Coordinated groundwater management in Scott Valley dates back to the 1960s with the investigation into groundwater development for irrigation, completed by the California Department of Water Resources. Since then, legal measures and representatives of beneficial users of the area's groundwater and surface water contributed to efforts to manage and preserve local water resources. Section 2.1.2 documents Scott Valley's history of groundwater management, which includes key publications, water management programs, and the passage of relevant legislation.

### *Water Resources Monitoring and Management Programs (Section 2.1.3)*

Section 2.1.3 documents monitoring and management of surface water and groundwater resources in the Basin and their relation to GSP implementation. These include federal, state and local agencies and associated activities in Scott Valley.

### *Land Use Elements or Topic Categories of Applicable General Plans (Section 2.1.4)*

Applicable land use and community plans in the Basin are outlined in Section 2.1.4 including the Scott Valley Area Plan, Fort Jones and Etna General Plans and Williamson Act Land.

### *Additional GSP Elements (Section 2.1.5)*

Well policies, groundwater use regulations and the role of land use planning agencies and federal regulatory agencies in GSP implementation are outlined in Section 2.1.5.

## Basin Setting (Section 2.2)

*Section 2.2 includes descriptions of geologic formations and structures, aquifers, and properties of geology related to groundwater, among other related characteristics of the Basin.*

### *Hydrogeologic Conceptual Model (Section 2.2.1)*

The hydrogeologic conceptual model encompasses parts of the Basin setting including its geographical location, climate, geology, soils, land use and water management history, and hydrology (Sections 2.2.1.1 through 2.2.1.5).

### *Identification of Interconnected Surface Water Systems (Section 2.2.1.6)*

Interconnected surface water (ISW) is defined as surface water which is connected to groundwater through a continuous saturated zone. SGMA mandates an assessment of the location, timing, and magnitude of ISW depletions, and to demonstrate that projected ISW depletions will not lead to significant and undesirable results for beneficial uses and users of surface water.

The Scott River and its major tributaries are all considered part of the interconnected surface water system in the Basin (Figure 1). The magnitude and direction of flow exchange between surface water and groundwater varies both in time and spatially (i.e., the geographic distribution of gaining and losing stream reaches is not constant). When this flux is net positive into the aquifer, it is commonly referred to as stream leakage; when it is net positive into the stream it is often referred to as groundwater discharge or baseflow.

In most years, the net direction of stream-aquifer flux is as leakage into the aquifer. A net annual groundwater discharge to the stream system occurs only in the driest water years. The largest net groundwater replenishment from streams occurs in wet years. Seasonally, the magnitude of leakage from the streamflow system to the aquifer is greatest during late winter and early spring, while the magnitude of groundwater discharge to the stream is greatest in late fall at the end of the dry season. Spatially, in reaches and seasons when the river is not dry, the mainstem Scott River is alternately gaining and losing. In other words, river water weaves in and out of the aquifer on its journey south to north along the valley floor. The upper sections of tributaries tend to be losing stream reaches but conditions depend on precipitation levels during any given water year.

***Identification of Groundwater Depended Ecosystems (Section 2.2.1.7)***

SGMA refers to GDEs as “ecological communities or species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface”.

This definition includes both areas of vegetation and flowing surface waters supporting aquatic ecosystems. A surface Water Ad Hoc Committee was formed and categorized vegetation GDEs as Riparian Vegetation (adjacent to flowing surface water) and Non-Riparian Groundwater-Dependent Vegetation (not adjacent to flowing surface water but that utilize shallow groundwater). The initial dataset and mapped geographic extent inventory was vetted by members of this committee and a final map was produced. Groundwater dependent species are identified for the Basin, and habitat ranges were confirmed to verify the presence of species in this area. The aquatic ecosystems in the Basin are related to the interconnected surface water identification, discussed in the previous section. Of particular interest in the Basin is the aquatic habitat utilized by anadromous fish including coho salmon, Chinook salmon, and Steelhead trout. The life cycles, habitat requirements, priority habitat locations in the Basin, and threats are discussed for each of these species. Species were prioritized for management based on their vulnerability to changing groundwater conditions and depletions of surface waters. These prioritized species are considered throughout the GSP, particularly in setting the sustainability indicators defined in Chapter 3 and identifying projects and management actions identified in Chapter 4.

## Current and Historical Groundwater Conditions (Section 2.2.2)

***Groundwater Elevation (2.2.2.1)***

Groundwater levels in the Basin have remained relatively consistent from 1965 to 2020 [1], despite significant increases in groundwater pumping over this period. Seasonal cycling of groundwater levels is noted throughout the Basin, with decreasing levels in the summer months followed by increasing levels in the winter months. Based on data from the Scott Valley Community Groundwater Measuring Program, collected from 2006 to 2018, several wells showed declines in fall groundwater levels with lowest groundwater levels generally observed in 2014, though some wells had lowest water level measurements in 2020. Decreasing year-over-year groundwater levels are apparent during drought periods (2007-2009 and 2012-2016). No significant long-term trend in water levels was noted over this period. Low fall water levels have occurred more frequently over the past two decades as drought conditions have been more frequent. Historic and recent water level data do not indicate overdraft or long-term declines in groundwater data. Groundwater measurements from select wells in Scott Valley are shown in Figure 2.

*Estimate of Groundwater Storage (2.2.2.2)*

Groundwater storage is estimated based on the foundational geologic report for the Basin. Overall groundwater storage in the basin was estimated at 400, 000 acre-feet (AF) (4.9E+08 m3), distributed throughout six different groundwater units (Mack 1958) over half of this estimated groundwater storage capacity located in the Scott River floodplain deposits.

*Groundwater Quality (Section 2.2.2.3)*

Groundwater in the Basin is generally of good quality and meets local needs for municipal, domestic, and agricultural uses. Water quality parameters including nitrate, specific conductivity, and benzene were monitored and collected from the Groundwater

[1] Based on the six long-term records available, two near Etna and four near the Scott River mainstem, near and north of Fort Jones

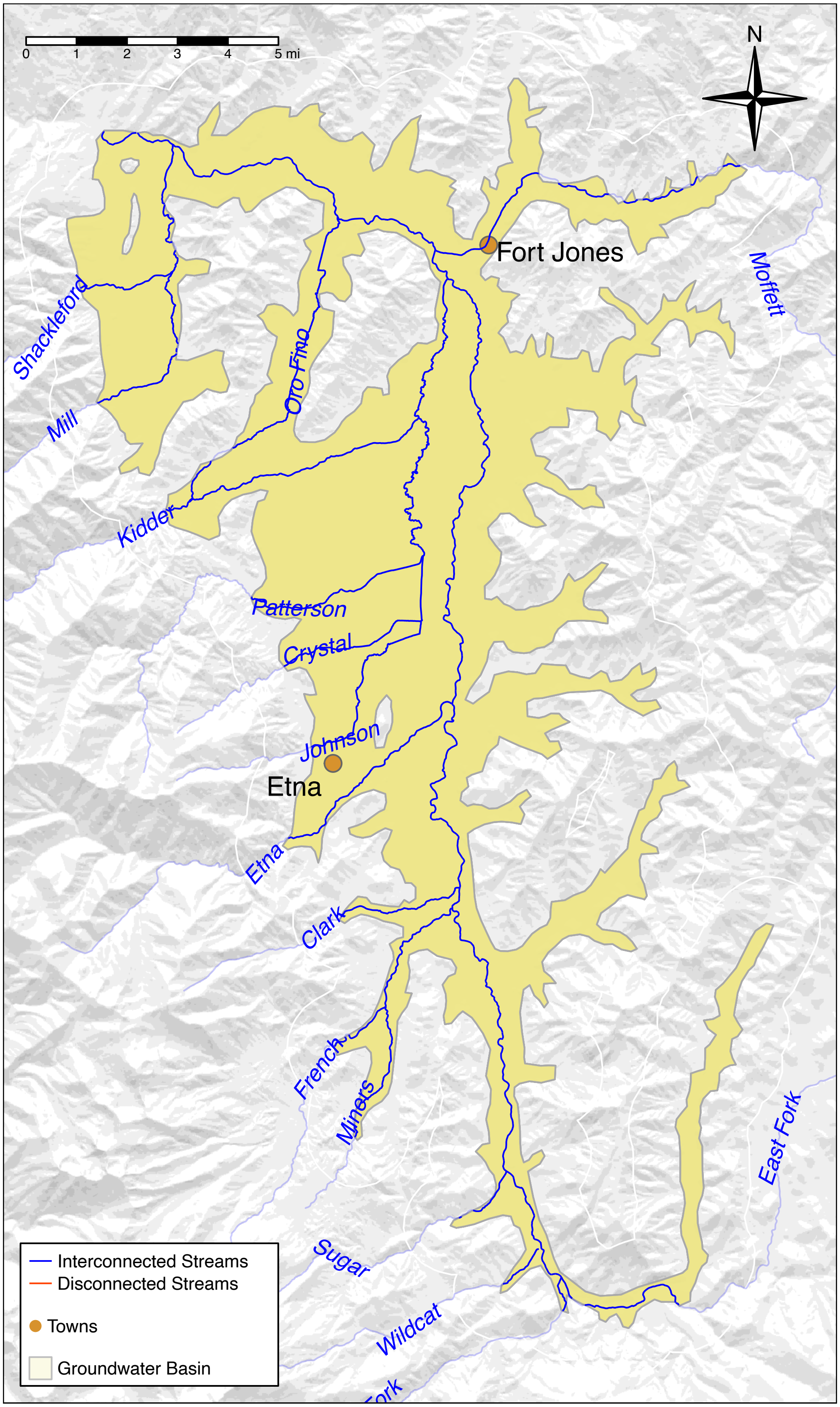



Figure 1: Interconnected Surface Waters (ISWs) in the Scott Valley. All surface water reaches overlying the Scott Valley groundwater basin have been designated as ISWs for purposes of this GSP.

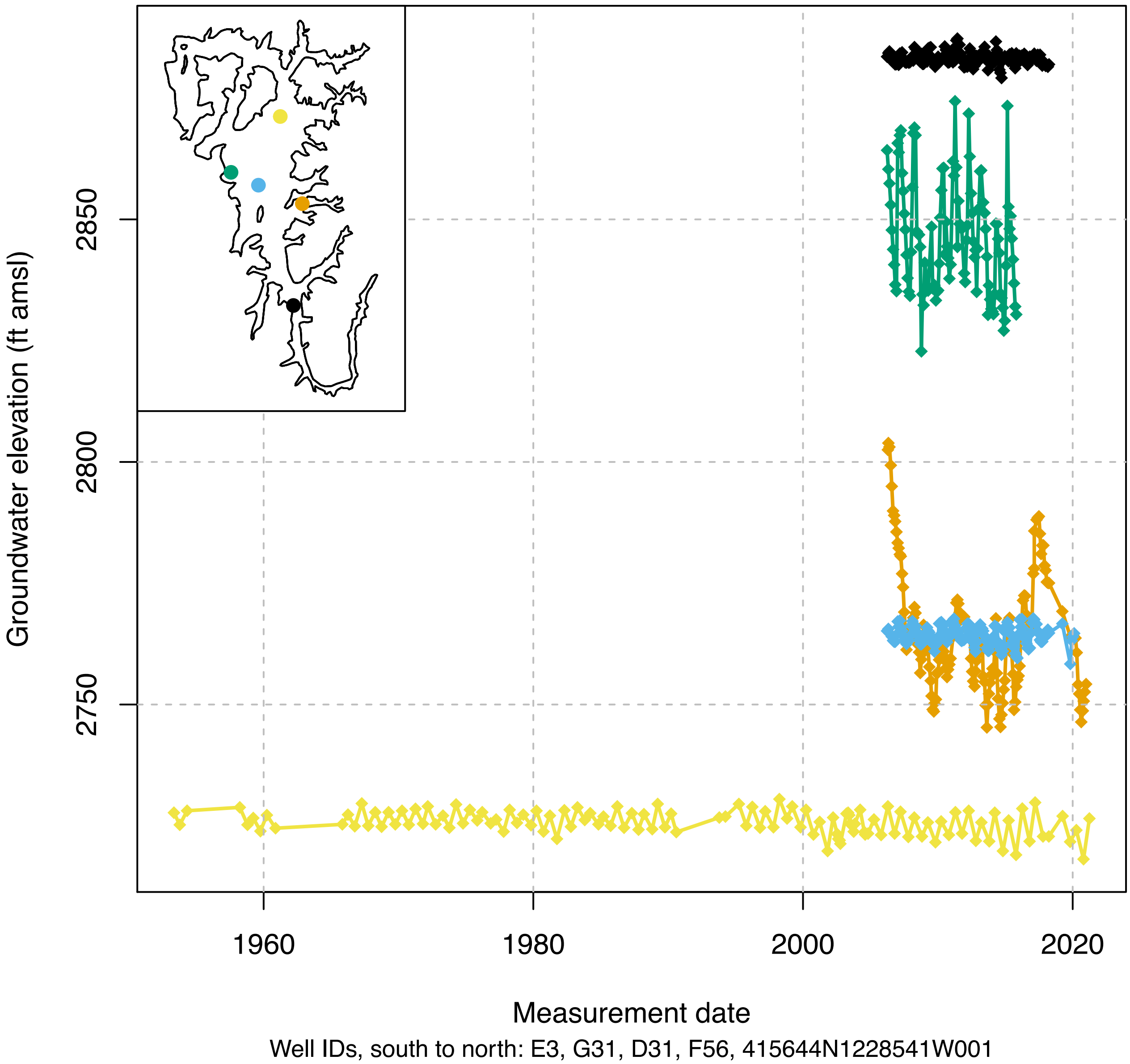



Figure 2: Selected long-term groundwater elevation measurements over time in five wells, one located in each hydrogeologic zone of the Scott River Valley Groundwater Basin.

Ambient Monitoring and Assessment Program (GAMA) and other data sources. Though groundwater quality data dates to the 1950s for some constituents, recent data from the past 30 years (1990-2020) was used to characterize Basin groundwater quality. Values for most of the constituents evaluated in this recent timeframe (as discussed in Appendix 2-B), did not show exceedances of the associated regulatory threshold. Exceedances of several contaminants including benzene were isolated to known contaminated sites in the Basin which are undergoing the process of remediation. Though nitrate data did not show exceedances of the maximum contaminant level (MCL) of 10 mg/L as N and specific conductivity values were generally lower in than the recommended secondary maximum contaminant level (SMCL) of 900 µg/L, these constituents were identified as a potential threat to groundwater quality due to current land uses and activities, and the limited spatial coverage of data used in the water quality assessment. This is supported by a NCRWQCB study from 2020 (NCRWQCB 2020) which identified Scott Valley as one of the groundwater Basins facing threats to groundwater quality due to excessive salt and nutrients. The known contaminated sites in the Basin, including two leaking underground storage tank (LUST) sites and two California Department of Toxic Substance Control (DTSC) sites, and the associated status and history of remediation, are detailed in this section.

*Land Subsidence Conditions (Section 2.2.2.4)*

Land subsidence is lowering of the ground surface elevation. Little to no land subsidence has been observed in the Basin and generally ranges from 0.5 to -0.25 ft from 2015 to 2018.

*Seawater Intrusion (Section 2.2.2.5)*

Seawater intrusion is not considered to be an issue in the Basin due to the distance between the Basin and the Pacific Ocean (which is more than 60 miles to the west) and the high elevation of land surface (generally more than 2,000 feet above mean sea level).

***Water Budget (Section 2.2.3)***

The historical water budget for the Basin was estimated for the period October 1991 through September 2018, using the Scott Valley Integrated Hydrologic Model (SVIHM). This 28-year model period includes water years ranging from very dry (e.g., 2001 and 2014) to very wet (e.g., 2006 and 2017). On an interannual scale, it includes a multi-year wet period in the late 1990s and a multi-year dry period in the late 2000s and mid-2010s. The water budget is presented as flows into and out of three subsystems of the integrated watershed: the surface water, the soil zone, and the aquifer.

Annual tributary inflow into the Basin is by far the largest input, and ranges from 91 to 640 TAF, with a median of 276 TAF. Rainfall inputs to the soil zone range from 34 to 151 TAF (median 81) per year, and a lateral flux of Mountain Front Recharge (MFR) is assumed constant at <18 TAF. Annual outflow from the Basin occurs largely as Scott River flow exiting the Basin to the northwest (ranging -689 to -85 TAF, median of -292), though a significant portion leaves as ET (-130 to -90 TAF, median of -112).

Interannual change in storage terms are greatest in the aquifer subsystem, ranging from -29 to 24 TAF with a median value of 3. In the soil zone subsystem the change in storage ranges from -10 to 7 TAF with a median of 0. Inputs and outflows are almost perfectly balanced in the surface water subsystem, with year-over-year surface water storage change having a maximum value of 2 TAF and a median of 0.

Within the integrated model, fluxes from each subsystem to the other two subsystems are simulated as distinct components (e.g. stream leakage, recharge through the soil zone, and applied irrigation water). This section contains a description of each water budget component.

Fifty-year future projected water budgets were developed using historical hydroclimate data (for water years 1991-2011) and four climate change scenarios were applied to explore potential effects of global warming on the Scott Valley watershed.

## ES-3: SUSTAINABLE MANAGEMENT CRITERIA (CHAPTER 3)

*Chapter 3 builds on the information presented in the previous Chapters and details the key sustainability criteria developed for the GSP and associated monitoring networks.*

***Sustainability Goal and Sustainability Indicators (Section 3.1)***

The Sustainability Goal of the Basin is to maintain groundwater resources in ways that best support the continued and long-term health of the people, the environment, and the economy in Scott Valley, for generations to come. The GSP details six sustainability indicators with a goal of preventing undesirable results to any one of the following sustainability indicators:

1. Chronic Lowering of Groundwater Levels
2. Reduction of Groundwater Storage
3. Degraded Water Quality
4. Depletions of Interconnected Surface Water
5. Seawater Intrusion
6. Land Subsidence

Table 1 defines undesirable results for each sustainability indicator. Quantifiable minimum thresholds (MT), measurable objectives (MO), and interim milestones (IM) were also developed as checkpoints that evaluate progress made towards the sustainability goal and are quantified in Chapter 3 of the GSP. Monitoring wells throughout the basin will be used to assess conditions relevant to each sustainability indicator. Monitoring wells were selected based on well location, monitoring history, well information, and well access. The Scott Valley Integrated Hydrologic Model (SVIHM) and its future updates are used to monitor and assess the depletions of interconnected surface water. SVIHM was developed and will continue to be updated based on a wide range of past and ongoing monitoring and research activities, including water level measurements, stream gaging, aquifer assessments, and monitoring of projects and management actions. It represents the scientifically and technologically most accurate and defensible approach to measuring stream depletion due to groundwater use, and the reversal of stream depletion due to future projects and management actions.

| Sustainability Indicator | Undesirable Result Defined |
|---|---|
| Chronic Lowering of Groundwater Levels | The fall low water level observation in any of the representative monitoring sites in the Basin falls below the respective minimum threshold for 2 consecutive years. |
| Reduction of Groundwater Storage | Same as ”Chronic Lowering of Groundwater Levels.” |
| Degraded Water Quality | More than 25% of groundwater quality wells exceed the respective maximum threshold for concentration and/or concentrations in over 25% of groundwater quality wells increase by more than 15% per year, on average over ten years. |
| Depletions of Interconnected Surface Water | The Basin is currently experiencing undesirable results with respect to this sustainability indicator; the undesirable result is avoided by achieving an average stream depletion reversal of at least 15% of the depletion caused by groundwater pumping outside of the adjudicated zone in 2042 and later, as defined by specific reference scenarios with SVIHM. |
| Seawater Intrusion | Not applicable for the Basin. |
| Land Subsidence | Groundwater pumping induced subsidence is greater than the minimum threshold of 0.1 ft (0.03 m) in any single year; |

Table 1: Scott Valley GSP undesirable results defined for each sustainability indicator.

## ES-4: PROJECTS AND MANAGEMENT ACTIONS TO ACHIEVE SUSTAINABILITY (CHAPTER 4)

*Chapter 4 describes past, current, and future projects management actions used to achieve the Scott Valley sustainability goal.*

To achieve the sustainability goals for Scot River Valley by 2042, and to avoid undesirable results over the remainder of a 50-year planning horizon, as required by SGMA regulations, multiple projects and management actions (PMAs) have been identified and considered in this Groundwater Sustainability Plan (GSP).

Projects and management actions (PMAs) are categorized into three different tiers, as follows:

**Tier I: Existing PMAs that are currently being implemented and are anticipated to continue to be implemented.**

Projects in Tier I include Scott River tailings streamflow and ecological benefit restoration projects, among other stream restoration projects. Management actions in this category include groundwater use restrictions, the Scott and Shasta Valley Watermaster District, and the Scott River Water Trust leasing program.

**Tier II: PMAs planned for near-term initiation and implementation (2022–2027) by individual member agencies.**

Tier II PMAs include a recharge project, voluntary managed land repurposing, beaver dam analogues, irrigation efficiency improvements and avoiding significant increase of total net groundwater use from the Basin.

**Tier III: Additional PMAs that may be implemented in the future, as necessary (initiation and/or implementation 2027–2042).**

Tier III PMAs, identified as potential future options, include managed aquifer recharge (MAR) and in-lieu recharge (ILR), utilizing lower ET crops, reservoirs, an expanded watermaster program, and floodplain reconnection.

Additionally, other management actions are outlined that may be explored during GSP implementation are outlined.

## ES-5: PLAN IMPLEMENTATION, BUDGET AND SCHEDULE (CHAPTER 5)

*Section 5 details key GSP implementation steps and timelines. Cost estimates and elements of a plan for funding GSP implementation are also presented in this section.*

Implementation of the GSP will focus on the following several key elements:

1. GSA management, administration, legal and day-to-day operations
2. Implementation of the GSP monitoring program activities
3. Technical support, including SVIHM model updates, SMC tracking, and other technical analysis
4. Reporting, including preparation of annual reports and 5-year evaluations and updates
5. Implementation of PMAs
6. Ongoing outreach activities to stakeholders

Annual implementation of the GSP over the 20-year planning horizon is projected to cost between $135,000 and $230,000. The GSA may pursue funding from state and federal sources for GSP implementation. As the GSP implementation proceeds, the GSA will further evaluate funding mechanisms and fee criteria and may perform a cost-benefit analysis of fee collection to support consideration of potential refinements.