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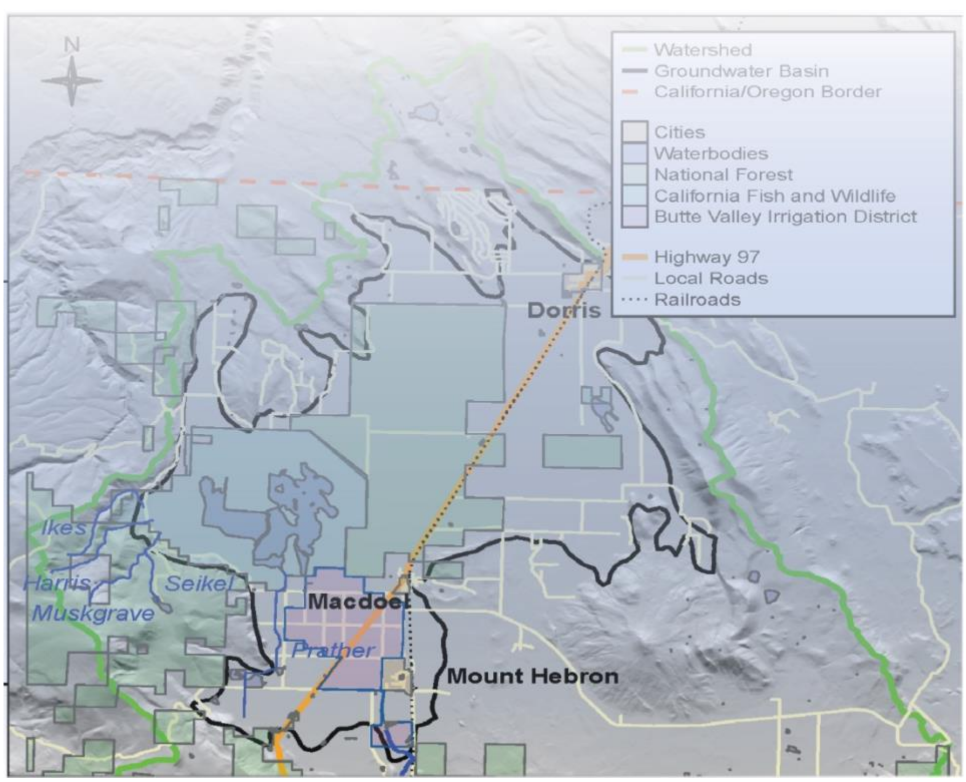
EXECUTIVE SUMMARY

SISKIYOU COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

Butte Valley Groundwater Sustainability Plan

FINAL DRAFT REPORT



SISKIYOU COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT GROUNDWATER SUSTAINABILITY AGENCY BUTTE VALLEY GROUNDWATER SUSTAINABILITY PLAN (Public Draft)

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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., Butte 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 Butte 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 Butte Valley Basin area. 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 Butte Valley Basin (the Basin) is a medium priority basin located in Northern California. The Basin is surrounded by several mountain ranges: the Cascade Mountains in the north, south and west, the Mahogany Mountain ridge in the east and Sheep Mountain and Red Rock Valley in the southeast. The major water features in the basin are Meiss Lake and several streams including Butte Creek. The primary communities in Butte Valley are the City of Dorris (population 962) and the smaller communities of Macdoel (population 155) and Mount Hebron (population 81) (DWR 2016b). All three of these populations are classified as severely disadvantaged communities (SDACs), based on annual median household income. The most significant land use in the Basin is for agriculture, accounting for 38.7% of the land in the Basin according to the 2010 County land use survey (DWR 2010) with primary crops of alfalfa, hay, and strawberry.

Water Resources Monitoring and Management Programs (Section 2.1.2)

Section 2.1.2 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 their associated activities in Butte Valley.

Land Use Elements or Topic Categories of Applicable General Plans (Section 2.1.3)

Applicable land use and community plans in the Basin are outlined in Section 2.1.3 including the County of Siskiyou General Plan and City of Dorris General Plan.

Additional GSP Elements (Section 2.1.4)

Well policies, groundwater use regulations and the role of land use planning agencies and federal regulatory agencies in GSP implementation are outlined in Section 2.1.4.

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 the Basin setting including its geographical location, climate, geology, soils, land use and water management history, and hydrology (Sections 2.2.1.1 through 2.2.1.9).

Current and Historical Groundwater Conditions (Section 2.2.2)

Groundwater Elevation (2.2.2.1)

Groundwater levels in the Basin fluctuate on a short-term scale with a seasonal high in the spring and seasonal low in the fall, and over the long term based on precipitation levels and changes in the amount of total groundwater extraction. Groundwater recharge in the Basin depends on precipitation, which has been in decline since the 1980s. Groundwater levels have decreased around 30 ft from the spring of 1979 to the spring of 2015; the decline in groundwater levels in five wells is shown in Figure 1.1.

Estimate of Groundwater Storage (2.2.2.2)

Groundwater storage and specific yield are difficult to estimate due to the interconnectivity of all unconfined and confined units, and critical data gaps in the main water bearing and recharge unit, the High Cascade Volcanics. For the unconfined units, Lake Deposits, pyroclastic rocks, and Butte Valley Basalt, the weighted average specific yield is calculated to be 9.5% and total groundwater storage capacity is 2,560,000 acre-feet. The High Cascade Volcanics has unknown depth and extent, and a total estimate of storage is based on the Butte Valley Integrated Hydrologic Model (BVIHM) (see Section 2.2.3).

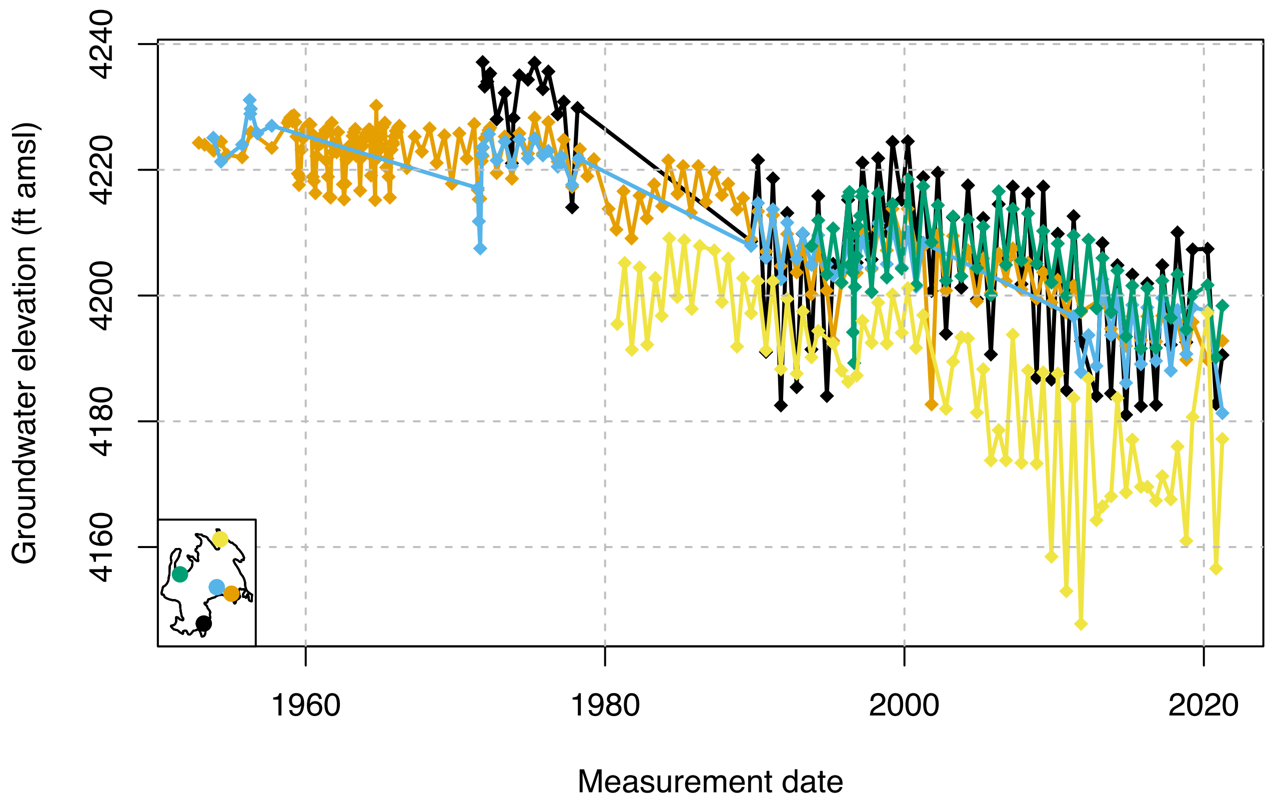

Figure 1.1: Groundwater elevation measurements over time in five wells, one located in each hydrogeologic zone.

Groundwater Quality (Section 2.2.2.3)

Based on an evaluation of Basin groundwater quality using available monitoring data (see Appendix 2-B), a list of constituents of interest was generated for the Basin. This list includes 1,2 Dibromoethane, arsenic, benzene, boron, nitrate, and specific conductivity. The known contaminated sites in the Basin, include a PCE plume near Dorris, Calzona Tankways, and a former petroleum fueling facility.

Seawater Intrusion (Section 2.2.2.4))

The Basin is located well over 100 miles east of the Pacific Ocean with lowest observed water levels thousands of feet above mean sea level. Seawater intrusion is therefore not an issue of concern.

Land Subsidence Conditions (Section 2.2.2.5)

Land subsidence is lowering of the ground surface elevation and is not known to be currently or historically significant in the Basin. The maximum observed subsidence is approximately 0.15 ft (46 millimeters (mm)) between June 2015 to September 2019 in an area west of the City of Dorris. The change in land elevation was likely the result of localized land leveling. Land subsidence will continue to be periodically re-evaluated.

Identification of Interconnected Surface Water Systems (Section 2.2.2.6)

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 groundwater.

The Basin is a hydrologically closed basin. No surface water leaves the basin and the basin has no major drainage. Surface waters in Butte Valley are limited to Meiss Lake (hydrologically a terminal lake) and five creeks: Butte, Prather, Ikes, Harris, and Musgrave. Many of these waterbodies go dry in the summer and fall. Groundwater elevations near the creeks is an identified data gap. Interpolated (i.e., estimated) groundwater levels near the creeks are generally more than 30 feet below these creeks, suggesting losing stream conditions. Lack of streamflow data are also known data gaps. Additional information is required to determine in more detail the interconnections between the surface water bodies in Butte Valley with groundwater and the magnitude and direction of flow exchange.

Identification of Groundwater Depended Ecosystems (Section 2.2.2.7)

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

The habitat ranges of freshwater species in the Basin with special designations (i.e., endangered, threatened, species of special concern, or on a watch list), were mapped. Riparian vegetation is prioritized for management in the Basin: managing for riparian vegetation addresses the needs of other special-status species in the Basin. 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. Vegetative GDE identification and classification was conducted through:

- the mapping of potential GDEs;
- assigning rooting depths based on predominant assumed vegetation type;
- establishing representations of depth to groundwater;
- identifying potential areas where depth to groundwater, rooting depth, and presence of potential GDES confirm likely groundwater-dependence.

Potential mapped GDEs were grouped into two categories: assumed to be a GDE (where the grid-based anlaysis showed that the area is likely to be connected to groundwater) or assumed not a GDE (where the grid-based analysis showed that the area is disconnected from groundwater). Based on this analysis, around 10% of the mapped potential GDE area is likely connected to groundwater and assumed to be a GDE (shown in Figure 1.2, below). The current list of potential GDEs is considered tentative, a data gap, and dependent on collection of additional groundwater level data.

Water Budget (Section 2.2.3)

The historical water budget for the Basin was estimated for the period October 1989 through September 2018, using the Butte Valley Integrated Hydrologic Model (BVIHM). This 29-year model period includes water years ranging from very dry (e.g., 2014) to very wet (e.g., 1999). 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 two subsystems of the integrated watershed: the soil zone (land/soil model subsystem) and the groundwater subsystem. The water budget for the entire watershed is also included in this section.

In the historical water budget, inflows include precipitation on the valley floor (to land) and subsurface inflow or mountain front recharge from the surrounding quaternary volcanic underlying the upper watershed (to groundwater). Precipitation input is variable with a median of 86 TAF. With a median of 185 TAF, subsurface inflows are more than twice as large as precipitation. Basin outflows consist of evapotranspiration (from land) and subsurface outflow (from groundwater) with median values of 108 TAF and 169, respectively. Fluxes between the two subsystems include recharge (from land to groundwater) and groundwater pumping for applied water (from groundwater to land). Median recharge to groundwater is 54 TAF, 22 TAF lower than the median groundwater pumping value. This difference between pumping and recharge is made up for though lateral inflows into the Basin.

While soil zone storage shows minimal interannual change, aquifer storage varies, with a long-term trend indicating some groundwater depletion.

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 Butte 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.

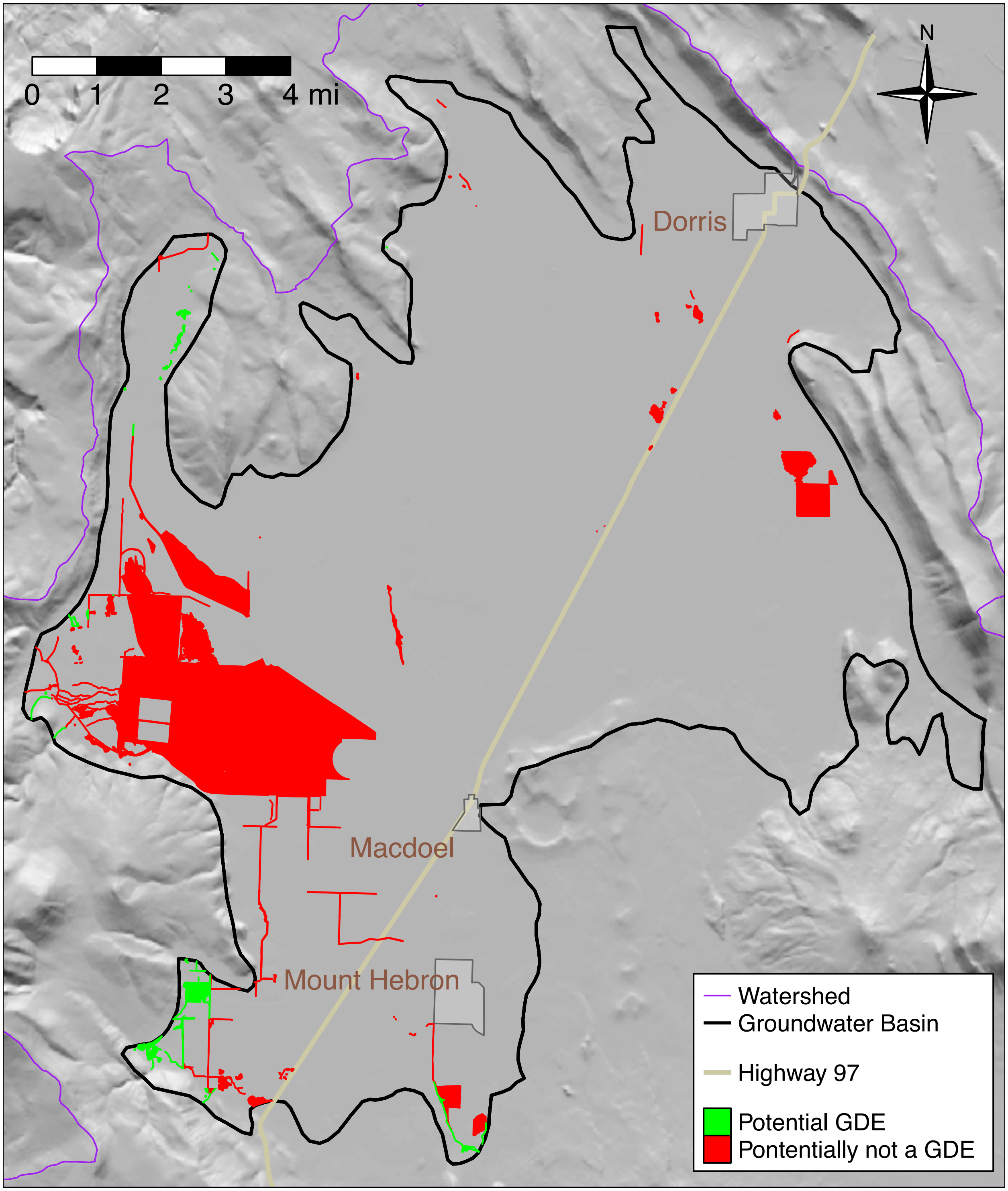

Figure 1.2: Categorized GDEs for the Butte Basin.

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 Shasta 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 1.1 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 success in maintaining 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.

Table 1.1: Shasta Valley GSP Sustainability Indicator undesirable results defined

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	SMCs not developed for this sustainability indicator due to lack of information on interconnectedness of surface water and groundwater in the Basin. Depending on funding and the filling of data gaps, SMCs may be set in a future GSP update.
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.

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 Butte Valley sustainability goal.

To achieve the sustainability goals for Butte 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 or management actions in the Tier I category include:

- Abandonment of Sam's Neck Flood Control Facility
- City of Dorris Water Conservation
- Well Drilling Permits and County of Siskiyou Groundwater Use Restrictions
- Kegg Meadow Enhancement and Butte Creek Channel Restoration
- Permit required for groundwater extraction for use outside the basin from which it was extracted (Siskiyou County Code of Ordinances)
- Upland Management
- Watermaster Butte Creek Flow Management

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

Tier II PMAs include:

- High Priority PMAs - Data Gaps and Data Collection
  - Butte Valley Integrated Hydrologic Model (BVIHM) Update (High Priority)
  - Drought Year Analysis (High Priority)
  - Expand Monitoring Networks (High Priority)
  - General Data Gaps (High Priority)
  - Groundwater Dependent Ecosystem Data Gaps (High Priority)
  - Interconnected Surface Water Data Gaps (High Priority)
- Avoiding Significant Increase of Total Net Groundwater Use from the Basin
- Management of Groundwater Use and Recharge
- Conservation Easements
- Dorris Water Meter Installation Project
- Irrigation Efficiency Improvements
- Public Outreach
- Voluntary Managed Land Repurposing (not including Conservation Easements)
- Well Inventory Program
- Well Replacement

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:

- Alternative, Lower ET Crops
- Butte Creek Diversion Relocation
- Butte Valley National Grassland Groundwater Recharge Project
- Strategic Groundwater Pumping Restriction

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 BVIHM 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.