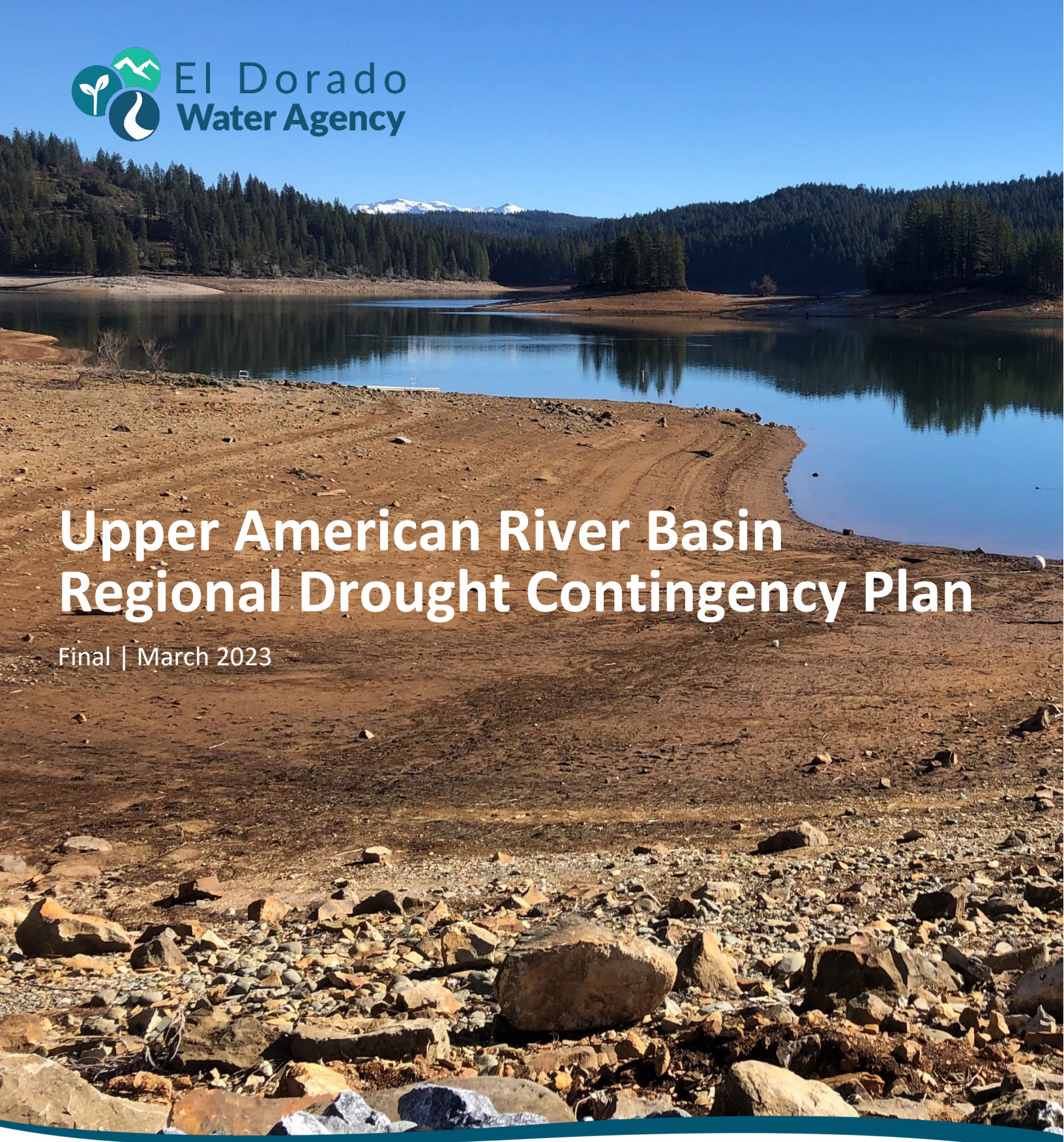
El Dorado Water Agency



Upper American River Basin Regional Drought Contingency Plan

Final | March 2023

In collaboration with:

Mission Statements

El Dorado Water Agency

Ensure that El Dorado County has adequate and affordable water to maintain economic prosperity, protect the environment, and support the rural-agriculture way of life for today and in the future.

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Abbreviations and Acronyms

AF	acre-feet/acre-foot
Agency	El Dorado Water Agency
ARBS	American River Basin Study
CDAG	County Drought Advisory Group
County	County of El Dorado
DPTF	Drought Planning Task Force
DWR	California Department of Water Resources
EC	Executive Committee
EID	El Dorado Irrigation District
FERC	Federal Energy Regulatory Commission
O&A	Operational and Administrative
GDPUD	Georgetown Divide Public Utility District
GFCSD	Grizzly Flats Community Services District
GIS	geographic information system
HMP	Hazard Mitigation Plan
M&I	municipal and industrial
NAB	North American Basin
O&M	operation and maintenance
OCA	Other County Area
PCWA	Placer County Water Agency
RDCP	Regional Drought Contingency Plan
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RMS	Resource Management Strategy
RWA	Regional Water Authority
U.S.	United States
UARB	Upper American River Basin
West Slope	El Dorado County area west of the Sierra Nevada Crest
WRDMP	Water Resources Development and Management Plan
WSCP	Water Shortage Contingency Plans

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1. Introduction

The Upper American River Basin (UARB) Regional Drought Contingency Plan (RDCP) lays out a plan to increase the resiliency of water resources in the face of future climate change conditions and droughts for the El Dorado County area west of the Sierra Nevada Crest (i.e., the West Slope). The 2021 Caldor Fire, a federally-declared disaster, and the ongoing drought, after only a few years of respite from the 2012-2016 drought, are a constant reminder to water managers and consumers in the West Slope of the severe vulnerabilities faced during droughts.

The three major public water agencies in the West Slope have drought plans which establish drought stage water supply conditions and ways to respond to those varying conditions when needed. Their water supplies rely mainly on the American River and local streams, of which the reliability is threatened by climate change and reduction in snowpack. These three major public water agencies only serve a small portion of the West Slope. The remainder of the West Slope (termed Other County Area (OCA)) instead relies on water from small water systems or domestic wells which are predominately supplied by fractured rock groundwater or local springs. [1] Understanding how droughts affect all areas throughout the West Slope and laying out a plan to mitigate and respond to those effects are imperative, and the UARB RDCP helps accomplish this.

1.1 Project Sponsors and Objectives

The El Dorado Water Agency (Agency) led the development of the UARB RDCP in close collaboration with the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), public water agencies, Tribes, land use authorities, resource managers and other interested parties. The Agency is the project sponsor for the UARB RDCP under the Drought Response Program of Reclamation's WaterSMART program. The Drought Response Program supports a proactive approach to drought by assisting water managers, especially water service contractors of Reclamation's Central Valley Project (CVP), to develop (or update) comprehensive drought plans and implement projects that will build long-term drought resiliency in CVP contractor's service areas through a more integrated, regional approach. The Agency and El Dorado Irrigation District (EID) are CVP contractors and the Agency's water service contract is to be used by EID and Georgetown Divide Public Utility District (GDPUD), another public water agency in the West Slope.

The UARB RDCP objectives are to:

- Improve resiliency to droughts in the West Slope, especially those areas not served by a public water agency.
- Lay out a plan for regional implementation to improve drought preparedness and resiliency.
- Improve regional collaboration for sustainable water resources management.

[1] Figure 1-2 shows the service area boundaries of the public water purveyors.

- Align water management planning efforts of Reclamation and water agencies in the West Slope.

1.2 Planning Area

The planning area of the UARB RDCP is the West Slope (**Figure 1-1**). The West Slope includes a diverse landscape of headwaters, national forests, and predominantly rural-agricultural surroundings with some urbanization. It includes portions of the Upper American River and Cosumnes River Watersheds. The following text describes the major sectors within the planning area.

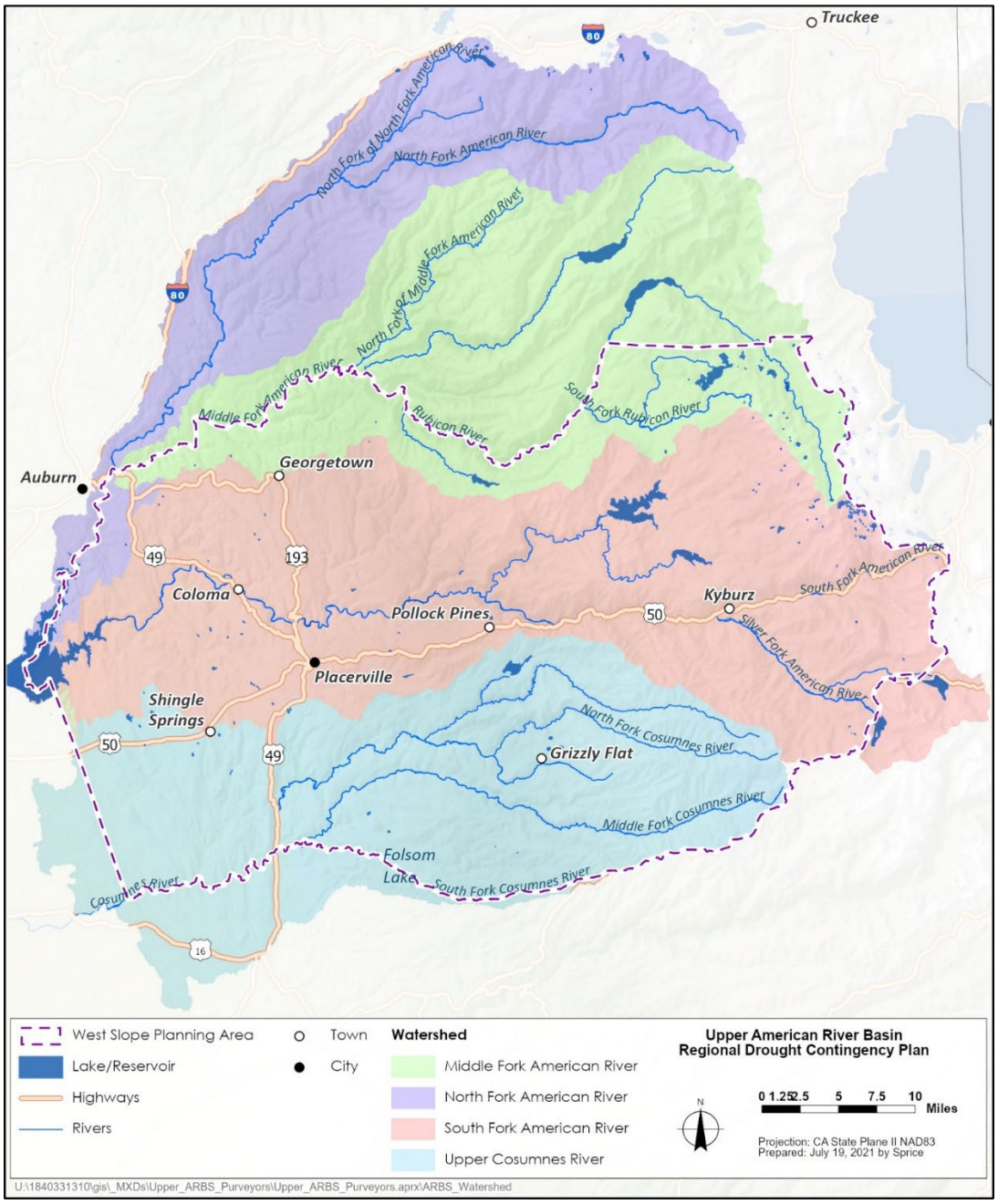


Figure 1-1. Upper American River Basin Regional Drought Contingency Plan Planning Area and Watersheds

1.2.1 Water Supply Sector

The economic prosperity envisioned in the County General Plan requires clean, affordable, and reliable water supplies to balance urbanization and the rural-agricultural way of life. Water supplies in the West Slope originate from the Sierra Nevada snowpack as runoff that replenish the rivers, lakes, and the fractured rock groundwater.

There are three public water agencies who all serve surface water in the West Slope: EID, GDPUD, and Grizzly Flats Community Services District (GFCSD). As shown in **Figure 1-2**, these agencies' service areas do not cover the entire West Slope. Residents, farms, ranches, and businesses outside these service areas make up the OCA,[2] and primarily rely on groundwater. The OCA is either served by small water systems or are individual self-supply users with domestic wells. Most residents in the OCA rely on the West Slope's shallow groundwater supplies from low-yield, unreliable fractured rock aquifers that is considered an unreliable water supply for large-scale use due to the limited capacity and uncertainties surrounding these fractured bedrock formations. Additionally, existing infrastructure does not allow for much exchange of water supplies between the public water agencies and those in the OCA. Overall, these features of natural and man-made infrastructures in the West Slope make the region susceptible to droughts.

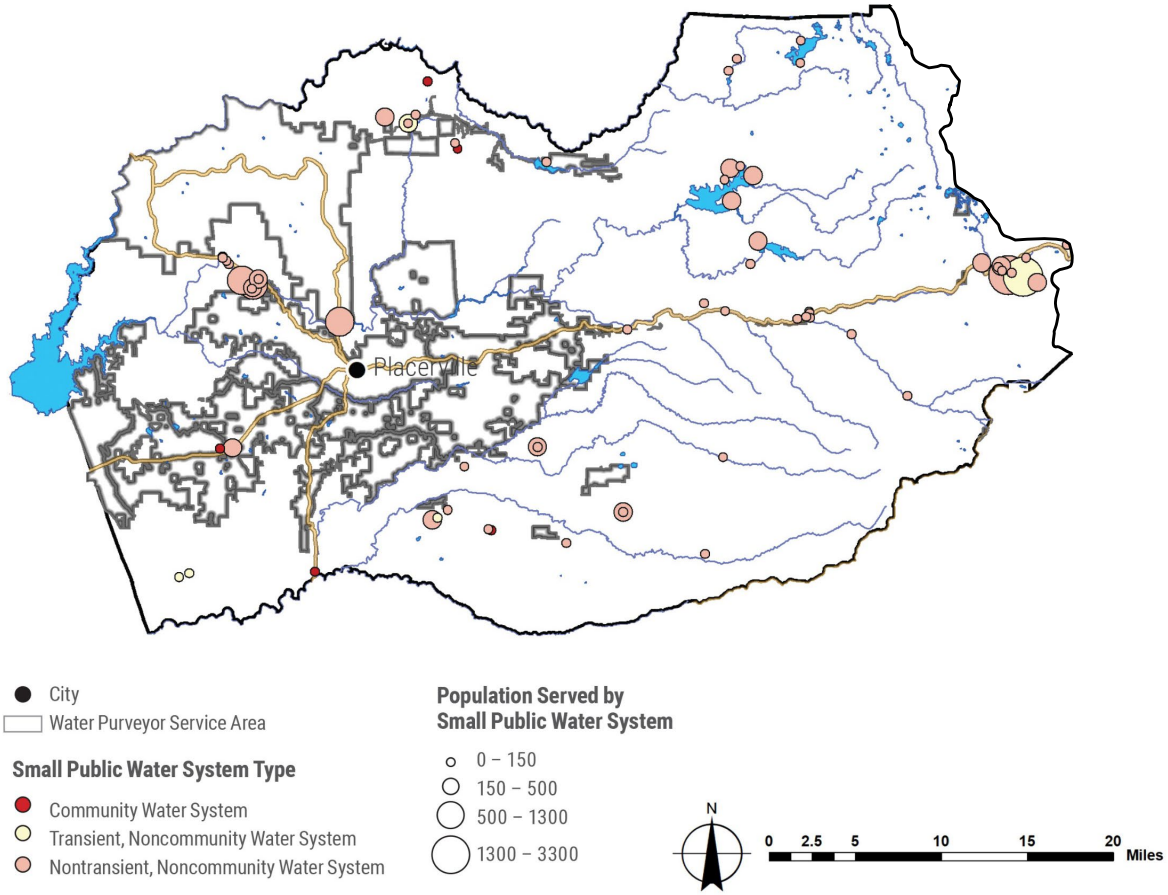


Figure 1-2. Public Water Agency Service Area Boundaries and Small Water Systems in Planning Area

[2] Note that the OCA does not include areas outside of the County General Plan land use designations (i.e., private timber land, state- and federally-managed land).

In the West Slope, water is stored and distributed for supply and hydropower generation purposes. Folsom Reservoir is owned and operated by Reclamation as part of the CVP to provide flood control, hydropower, and water supplies. EID owns and operates Jenkinson Lake Reservoir in Pollock Pines and Project 184 including Echo, Aloha, Caples, and Silver Lakes. According to EID's 2013 Integrated Water Resources Master Plan, EID also diverts its CVP contract water from Folsom Reservoir. GDPUD owns and operates Stumpy Meadows Reservoir east of Georgetown in addition to several ditches used for conveyance. GFCSD owns and operates its own reservoir and diverts water from North Canyon Creek and Big Canyon Creek. Some of the infrastructure owned by EID and GDPUD are from the Gold Rush era and consist of several wooden flumes used for conveyance. Most of the water infrastructure in the Sacramento Municipal Utility District (SMUD) Upper American River Project is also located in El Dorado County—including 11 dams, 8 powerhouses (to meet electricity demands), and Loon Lake (a major water storage reservoir).

In the West Slope, water quality concerns are generally low although there are some impaired bodies of water on the Clean Water Act 303(d) list because they have a high presence of mercury, aluminum, manganese, *Escherichia coli*, invasive toxic species, sediment, or iron. In the West Slope, naturally occurring arsenic and pollution from septic tank systems can sometimes create water quality concerns. The extensive agricultural practices in the West Slope are of low toxicity and pose a limited risk of groundwater contamination.

1.2.2 Economic Sector

El Dorado County has experienced rapid population growth since the 1970s and is projected to grow by 30,000 households over the next 20 years. In anticipation of future growth, the County of El Dorado (County) General Plan (2004) vision identifies necessary mitigation for economic development while preserving the way of life in rural-agricultural communities. In 2014, the County Board of Supervisors approved a 1.03 percent annual growth rate for the next 20 years.

For the West Slope, the General Plan lays out a rural-agricultural dominated landscape with high density urban development concentrated in areas adjacent to Sacramento County and along Highway 50 using a combination of land use designation, zoning ordinance designation, and policies. Historically, growth in the West Slope has resulted in compact development patterns. Communities such as Cool, Georgetown, Mt. Aukum, and Placerville were small, mixed-use communities where residents lived, worked, and shopped. Recently, large lot, low-density residential development has introduced a more rural lifestyle throughout the West Slope and has slowly transformed rural areas into areas characterized with dispersed residential uses.

Constrained by the terrain, commercial farming operations in El Dorado County are small in comparison to those of the Central Valley, on average less than 3 acres; large corporate farming operations do not exist in El Dorado County. The total value of agriculture in El Dorado County is estimated to be over $70 million including livestock, rangeland, animal, and timber products. Specifically in the West Slope, agriculture is characterized by a mix of small, specialty markets and more traditional wholesale agricultural export markets. As such, the value of West Slope production is more closely linked to direct-to-consumer products and agritourism in the region. In general, agricultural acreage in El Dorado County and West Slope has been slowly growing over the last several decades, and the value of this growing industry has been increasing in response to strong domestic and export market conditions, growing

agritourism demand, and expansion of direct-to-consumer fresh produce markets. Crops produced support significant economic activity in associated industries including livestock, fruit processing, and recreation and tourism (e.g., Apple Hill, wineries, and Christmas tree farms). It is generally understood that surface water is the dominant supply source of irrigation water in the West Slope.

In West Slope, agritourism has been a successful economic use of land. West Slope agritourism brings visitors from the Sacramento metropolitan area (including in El Dorado County), San Francisco Bay Area, Reno, and from all over the state. Agritourism demand generally increases with population growth, and most of the state's metropolitan areas have maintained average population growth of about 1.5% per year. This reflects a broader statewide benefit to supporting agriculture in West Slope with a reliable water supply.

In the West Slope, there are several disadvantaged communities (**Figure 1-3**). This includes three areas designated as a Severely Disadvantaged Community. They are predominantly provided water by EID and are located along the Highway 50 corridor in portions of the City of Placerville, Diamond Springs, and Pollock Pines.

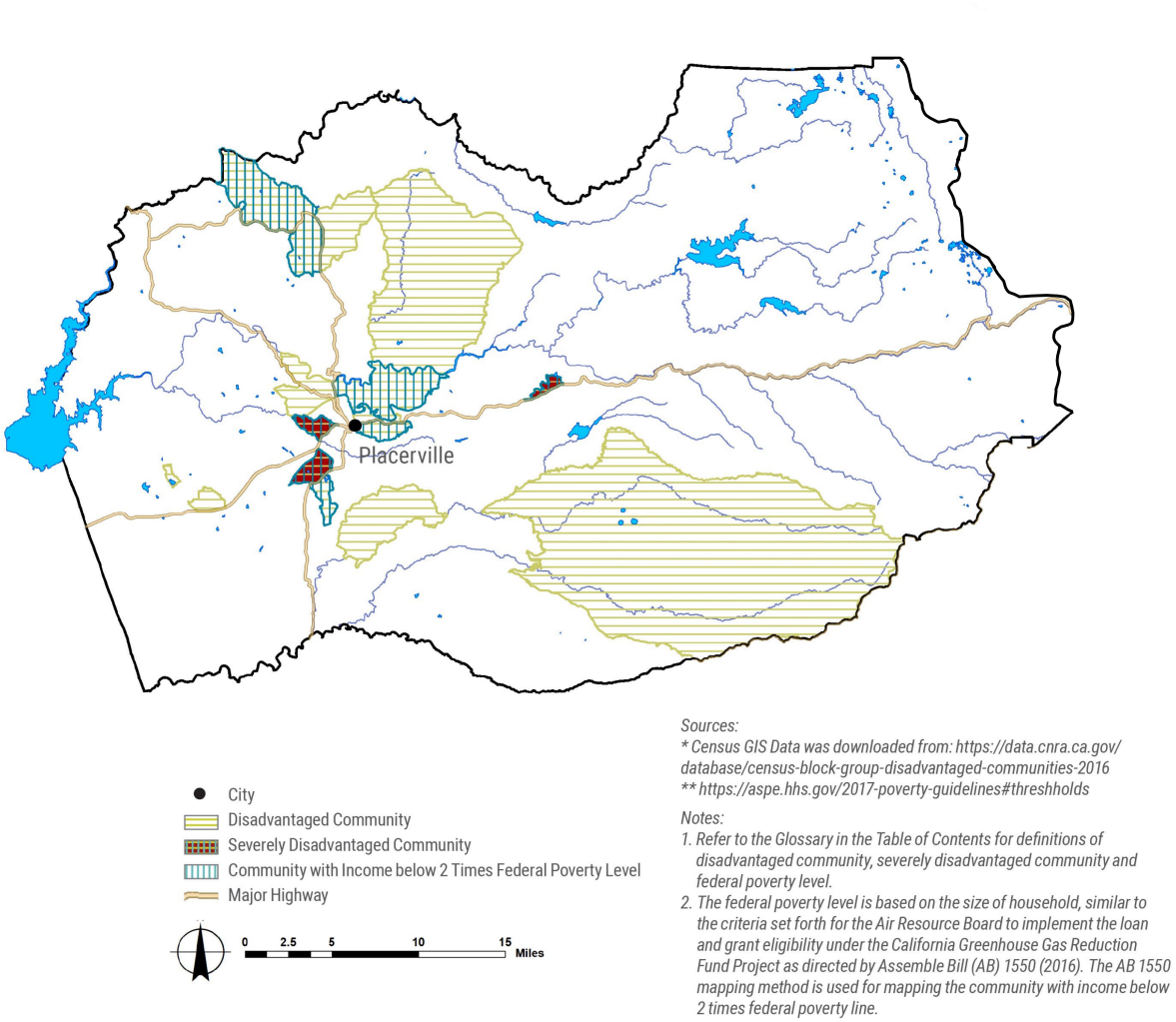


Figure 1-3. Disadvantaged Communities in Planning Area

1.2.3 Watershed Sector

The West Slope's topography is characterized by sweeping foothill areas and high mountains (i.e., the Sierra Nevada crest). Elevations range from 700 feet above mean sea level to more than 10,800 feet in the Sierra Nevada. The West Slope's climate varies based on elevation, with summers generally being longer, hotter, and drier in the lower elevations than summers in the higher elevations. There is little precipitation in the West Slope during the summer. Winters in the lower elevations are shorter and precipitation is primarily in the form of rain while winters in the higher elevations vary from short and mild with moderate snowfall to moderately severe with frequent snowfall.

The land and water resources in the West Slope are diverse, including woody and emergent herbaceous wetlands, timber, agricultural, recreation, wildlife-related, and rural and urban uses which merge together to form a complex mix of natural resource related opportunities and challenges.

The principal goal under the El Dorado County General Plan Conservation and Open Space Element is to "conserve and improve the County's existing natural resources and open space, including agricultural and forest soils, mineral deposits, water and native plants, fish, wildlife species and habitat, and federally classified wilderness areas; and preserve resources of significant biological, ecological, historical or cultural importance." The County General Plan recognizes the importance of protecting natural resources for long-term ecological needs and includes several types of land use designations and conservation areas—such as the Williamson Act, biological corridors, and ecological preserves—for environmental management. Pine Hill Preserve, the only ecological preserve in El Dorado County that has rare plant species and habitats, is an example of such policy implementation. In addition to the conservation areas, the health of the American River headwaters could directly affect the El Dorado County water supplies, especially in communities relying on local minor streams or springs. Two areas of headwaters management are critical:

- Meadow health that can affect water retention and water quality.
- Forest management to avoid high tree density with significant canopy cover that intercepts snowpack and reduces water retention.

Organized efforts to manage meadow health and forest density in the West Slope are likely to improve both water quality conditions and water retention in the headwaters. First-order estimates based on average climate information suggest that reducing forest cover by 40 percent of the maximum levels across a watershed can potentially increase water yields by 9 percent.

Decades of improper forest management have resulted in dense forests that not only affect water supply but also increase the threat of wildfires. Wildfire damages grow more severe every year. Although the cost of wildfire is often measured in lives lost, buildings destroyed, and acres burned, the total cost of wildfire extends well beyond these three metrics, starting with the money it takes to contain or suppress the fires—a figure that has grown significantly over the past three decades. There are also less quantifiable metrics that may be even more costly: disruptions to business, taxes, and tourism; residents left with significantly impacted economy; and polluted air, soil, and waterways. If not properly managed, this situation will get worse as the frequency, size, and intensity of these fires are expected to grow.

The County, like many Central Sierra counties, is home to numerous cultural resources. Historically, the Miwok and Maidu Indian tribes split the southwestern portion of what is now the County. The Maidu

tribe had vast territories to the north while the Miwok tribe went south with a small band along the Pacific coast, west of the County. In addition, the County's rich heritage is also well-grounded in its lumber, railroad, and transportation development past.

1.3 Work Plan

To guide UARB RDCP preparation, the Agency developed, and Reclamation approved, a work plan (Agency 2020a) that lays out the steps and components of the UARB RDCP. Through executing the work plan, the Agency fulfilled all requirements of Reclamation's WaterSMART Drought Response Program grant, including conducting UARB RDCP scope of work activities, coordinating and consulting with other UARB public water agencies, making decisions in collaboration with Reclamation related to UARB RDCP and resolving issues, preparing for and conducting UARB RDCP-related meetings, and acting on next steps/recommendations as appropriate.

1.4 Regional Collaborative Effort

The Agency recognized the importance of having a regionally accepted and implementable plan to create a lasting and significant improvement in drought resiliency. To create this type of plan, extensive collaboration was needed from a wide range of local entities that may be affected by drought. As such, and consistent with the work plan approved by Reclamation, the Agency convened two stakeholder groups to help inform and develop the UARB RDCP: Executive Committee (EC) and Drought Planning Task Force (DPTF). **Figure 1-4** shows the members in each group and **Table 1-1** their relevant areas of responsibility/interest.

The EC consisted of public water agencies and entities with specific management responsibilities for small water systems and rural communities that are vulnerable to droughts. Generally, the EC was composed of officers, general managers, assistant general managers, directors, department managers, and others who were appointed by their corresponding entity to act on behalf of, and within the powers granted to them. In general, these entities will be the implementers of the UARB RDCP. Therefore, the EC helped guide plan direction and content development, promoted consistency with local drought resiliency goals, and will support subsequent plan implementation.

The DPTF consisted of a wide-range of stakeholders and interested parties who had significant on-the-ground expertise addressing water management and drought protection across a variety of sectors such as agriculture, Tribes, conservation, environmental health, public utilities, and regional governance. The role of the DPTF was to focus on plan content review and provide input to improve efficiency, promote successful completion, and garner widespread acceptance of the UARB RDCP. **Table 1-2** summarizes the extensive content input and review by each group by UARB RDCP section.

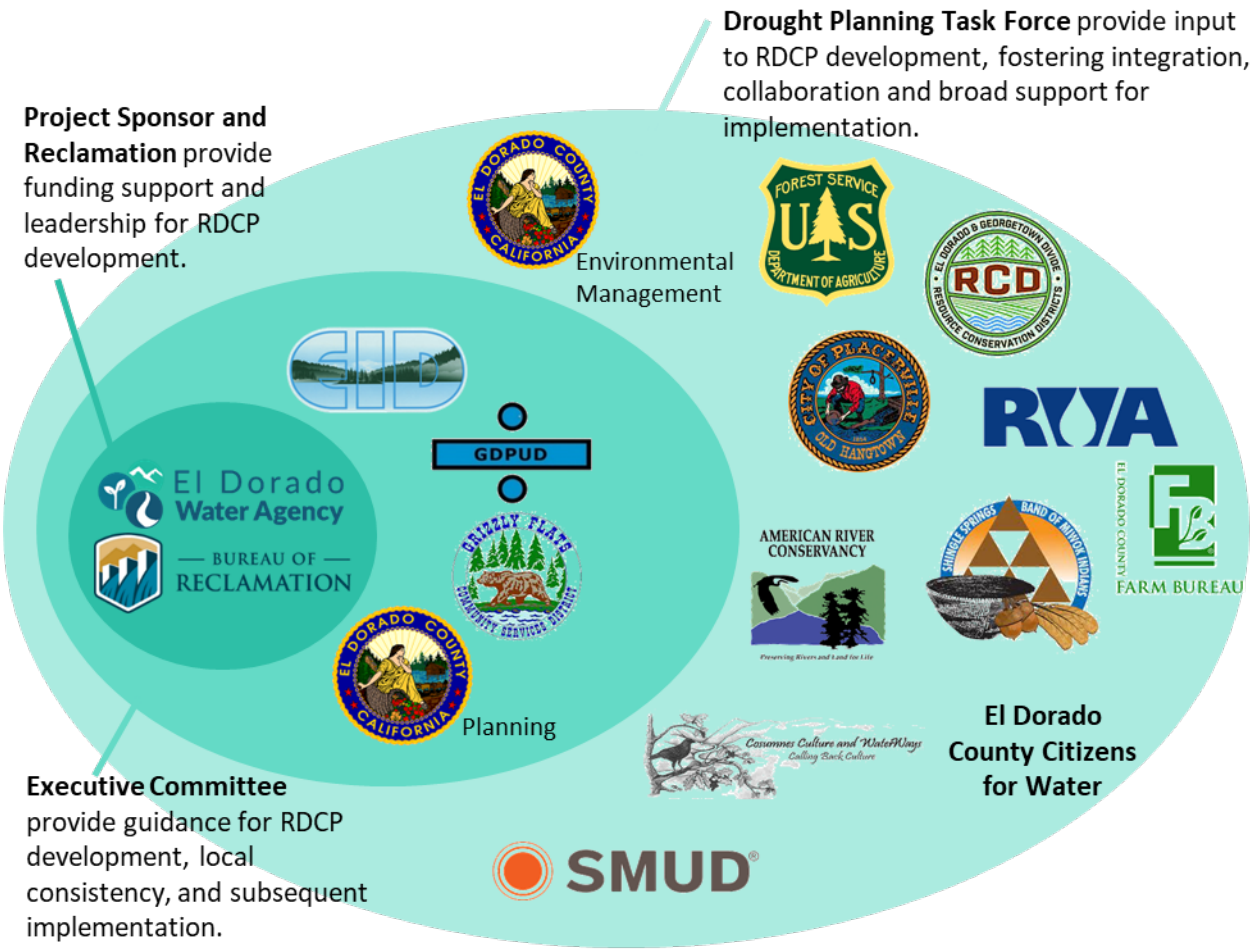


Figure 1-4. Regional Drought Contingency Plan Collaborating Partners

Table 1-1. Agencies and Organizations in the Executive Committee and Drought Planning Task Force

UARB RDCP Participating Partners	Organization Type					Responsibility or Interest										
	Local/ Regional	State	Federal	Tribal	NGO	Land Use	Water	Energy	Economic Development	Public Safety	Agriculture	M&I	Environment	Recreation	Forest Management	Timber
Executive Committee																
El Dorado Water Agency	X						X	X	X	X	X	X	X	X	X	
U.S. Department of Interior, Bureau of Reclamation			X				X	X	X	X	X	X	X	X		
El Dorado Irrigation District	X						X	X			X	X		X		
Georgetown Divide Public Utility District	X						X				X	X			X	
Grizzly Flats Community Services District	X						X					X				
County of El Dorado	X					X	X		X	X	X	X	X	X	X	
Drought Planning Task Force																
County of El Dorado: Department of Agriculture, Weights, and Measures	X					X	X		X		X					
El Dorado County Farm Bureau					X		X	X	X		X		X			X
El Dorado County Band of Miwok Indians, and Cosumnes Culture and Waterways				X		X	X	X	X	X	X	X	X	X	X	
Shingle Springs Band of Miwok Indians				X		X	X	X	X	X	X	X	X	X	X	
El Dorado County Citizens for Water	X						X				X	X				
Sacramento Municipal Utility District	X						X	X	X	X			X	X	X	
City of Placerville	X					X	X		X	X		X	X	X	X	
American River Conservancy					X	X	X						X	X	X	

Table 1-1. Agencies and Organizations in the Executive Committee and Drought Planning Task Force, Continued

UARB RDCP Participating Partners	Organization Type					Responsibility or Interest										
	Local/ Regional	State	Federal	Tribal	NGO	Land Use	Water	Energy	Economic Development	Public Safety	Agriculture	M&I	Environment	Recreation	Forest Management	Timber
Drought Planning Task Force, Continued																
El Dorado and Georgetown Divide Resources Conservation Districts		X											X	X	X	
U.S. Forest Service, Eldorado National Forest			X			X	X			X			X	X	X	X
Regional Water Authority	X						X	X	X	X	X	X	X	X		

Table 1-2. UARB RDCP Engagement and Schedule

Topic	Meetings and Targeted Input		Executive Committee and Drought Planning Task Force Draft Section Review
	Executive Committee	Drought Planning Task Force	
Approach Confirmation	8/6/2020	12/9/2019 9/4/2020	✓
Drought Monitoring	8/6/2020 9/23/2020	9/4/2020	✓
Vulnerability Assessment	9/23/2020 1/27/2021	Review of vulnerability list	✓
Mitigation Actions *Identify Actions*	1/27/2021	Project Input via Google Forms	✓
Evaluate/Prioritize Actions	3/26/2021	3/26/2021	
Response Actions	5/10/2021	-	✓
Operations and Administrative Framework	5/10/2021	-	✓
Plan Update Process	5/10/2021	-	✓

In addition to these two groups, the Agency also kept other stakeholders and the public informed about UARB RDCP development and provided opportunities for review of the plan. Specifically, the Agency's actions toward informing the public and facilitating transparency included:

- Updates on the Agency's website which included information about the UARB RDCP, frequently asked questions, plan documents, and information on the public review process.
- Public briefings during the May 13, 2020, and August 11, 2021, meetings of Agency's Board of Directors.
- Public review period for the public draft UARB RDCP and opportunities for comment.
- Public communications on the UARB RDCP development and availability of public documents via the Agency's newsletter, NEWStream (2020b), and press releases.

The Agency continues to leverage opportunities to increase the awareness of drought and its potential impacts to the West Slope, as well as the regional efforts in developing the UARB RDCP and subsequent implementation.

1.5 Related Planning Efforts

The Agency, in coordination with others in the region, has long recognized the need to improve drought resiliency and overall water supply reliability. To leverage these pasts investments and expertise, the UARB RDCP referenced the following planning efforts:

- **2019 Water Resources Development and Management Plan (WRDMP) –** The Agency's 2019 WRDMP provides an integrated and collaborative water management approach to address the water resource-related challenges in El Dorado County, one of which is vulnerabilities during droughts. The WRDMP presents information on projected future demand and supply imbalances throughout the West Slope considering climate change which was used to quantify UARB RDCP vulnerabilities. The WRDMP identified strategic directives that may mitigate the identified challenges through an array of resource management strategies (RMS). In the WRDMP, the RMS represent strategic directives that may mitigate the identified challenges through coordinated and collective efforts of all responsible parties. Key actions, the primary responsible agency(ies), and Agency's corresponding roles in leading, facilitating, or supporting a given activity are also clarified, consistent with its authority and best ways for the Agency to create direct value and benefits for all communities in the County. RMS 7 specifically called for the development of a RDCP to improve drought resiliency in the West Slope using a regional approach.

- **American River Basin Study –** Reclamation and the Agency along with the other non-federal partners, including Placer County Water Agency, Cities of Roseville, Sacramento, and Folsom, Regional Water Authority, and Sacramento Area Flood Control Agency, prepared the American River Basin Study (ARBS) (Reclamation et al. 2022). The ARBS developed data, tools, analyses, and climate change adaptation strategies specific to the American River Basin. The ARBS examined strategies to integrate or better coordinate local and federal water management to improve regional water supply reliability, while enhancing Reclamation's flexibility in operating Folsom Reservoir to meet flow and water quality standards in the Sacramento-San Joaquin Delta (Delta) and to protect endangered fishery species in the lower American River. The climate change data development, regional climate vulnerability assessments, climate adaptation portfolios development and evaluation, and implementation considerations from the ARBS were used to identify potential water supply-demand imbalances under climate change in the West Slope area.

- **Local Public Water Agency's Drought Plans –** Each of the public water agencies have established agency-specific drought plans that define water use reduction states during emergency conditions (EID 2020; GDPUD 2020; GFCSD 2007). The UARB RDCP builds on these existing public water agency-specific drought management efforts and other regional basin planning processes to identify system drought vulnerabilities and develop mitigation measures to address drought-related issues. The UARB RDCP complements the public water agency-specific drought plans and provides a coherent approach on a regional level for better coordination and promotion of shared benefits by the entire West Slope.

- **2007 Draft Drought Plan for El Dorado County Water Agency West Slope –** The draft drought plan (Agency 2007) was led by the Agency in collaboration with local stakeholders to identify actions and procedures for preparing for and responding to a drought in the

West Slope. This plan was prepared in conjunction with the above local plans. This draft plan later became the basis for the 2007 version of each public water agency's drought plan. The UARB RDCP expands the previous plan with updated information and management strategies, and an enhanced regional collaborative approach to address increasing drought threats.

- **2017 North American Basin Regional Drought Contingency Plan –** In October 2017, the NAB RDCP (RWA 2017) was completed to improve drought resiliency and response for the lower reaches of the American River watershed. It was collaboratively developed by Reclamation and the 17 water agencies in the NAB, with input and review from six additional agencies located adjacent to the NAB, including both the Agency and EID. Recognizing the interconnectedness of the upper and lower American River watershed, the UARB RDCP includes a representative from the NAB in the DPTF to promote collaboration across the entirety of the watershed.

1.6 Document Organization

The UARB RDCP is organized into seven sections as noted below.

- **Section 1 – Introduction**: This section describes the purpose and context for the UARB RDCP.
- **Section 2 – Drought Monitoring**: This section describes a framework for predicting and confirming future droughts by establishing data metrics used to indicate drought conditions in the planning area.
- **Section 3 – Vulnerability Assessment**: This section describes the process and findings of the vulnerability assessment that was conducted to evaluate the risks and impacts of current and future drought in the planning area.
- **Section 4 – Mitigation Actions**: This section describes the identification, evaluation, and prioritization of actions and activities to improve the planning area's resilience in the face of drought conditions.
- **Section 5 – Response Actions:** This section describes local and regional actions to expeditiously mitigate impacts during an ongoing drought.
- **Section 6 – Operational and Administrative Framework and Update Process:** This section describes the roles, responsibilities, and procedures for ongoing activities associated with the UARB RDCP including conducting drought monitoring; initiating mitigation and response actions, including communicating with the public about those actions; and evaluating and updating the UARB RDCP. Anticipated frequencies for these activities and potential funding and financing mechanisms are also discussed.
- **Section 7 – References:** This section lists references cited in this plan.

2. Drought Monitoring

Drought is a phenomenon that often occurs gradually, and its effects are not typically experienced immediately. As such, the recognition of early warning signs through drought monitoring is crucial for managing its potential effects. The purpose of drought monitoring is to provide early warning and prompt recognition of when local drought conditions exist or are likely to occur.

In the planning area, the public water agencies have already defined indicators for monitoring drought conditions within their service area. These indicators are defined in the public water agencies' respective drought plans and are generally tied to water reservoir conditions (EID 2020, GDPUD 2020, GFCSD 2007). These indicators allow resource management agencies and public water agencies to communicate drought conditions and drought actions to their customers. Aside from the areas within existing public water agency service areas, there are no defined drought monitoring indicators regionally or for the remainder of the RDCP planning area, namely the OCA, which is already more susceptible to the detrimental effects of droughts as described earlier.

The following steps were taken to inform and develop regional drought monitoring indicators:

1) **Water Availability Data** – Compile readily available data and identify which data should be retained and is the most informative for droughts in the planning area.
2) **Indicators** – Using the retained data, review existing indicators to determine their ability to regionally identify an onset of drought for the planning area.
3) **Triggers** – Identify which data and associated indicators, or combination thereof, should be used to trigger regional drought response actions in the planning area. Note that specific response actions will be presented in **Section 5**.

2.1 Water Availability Data

There are many publicly available data related to water availability in the planning area. These data are published from a variety of State, federal, and local sources. This section summarizes the relevant water availability data in the planning area. The data were presented to the EC and the DPTF in August and September 2020, respectively, to confirm whether any additional relevant data should be included. The data presented below was confirmed by the EC and DPTF.

The data were grouped into the following three categories based on the type of data and their potential uses:

- **Current Data** – Data informs current water supply conditions within the planning area, including major public water agency reservoir storage levels, Folsom Lake storage, Cosumnes River discharge, and local groundwater conditions.
- **Near-term Data** – Data informs forecasted water supply conditions over the next few months or year (e.g., forecast of the likely water availability later in the year) within the planning area, such as snowpack and forecasted streamflow.

- **Recent Trends Data** – Since droughts occur gradually, data looks at recent water availability trends to inform likely drought conditions.

The available data that are relevant to water availability in the West Slope are summarized in **Table 2-1.** Out of the 12 data sets listed below, only six were retained for further consideration. Data were retained if they were readily available and applicable to informing water supply conditions in the planning area. The retained data, together or independently, must provide insight on drought conditions within the planning area.

Table 2-1. Water Availability Data in the Planning Area

Data Set	Data Source	Data Type	Reason for Retaining Data for Further Drought Monitoring Consideration
Current Conditions			
EID Jenkinson Lake Storage	CDEC	Monthly Storage Data	• The data provides the current reservoir storage levels at EID's main reservoir. • Data was retained for further consideration since data is used by EID to establish drought response actions. Reservoir storage levels are tracked and reviewed by a drought team comprised of EID staff to establish potential drought response actions within EID.
GDPUD Stumpy Meadows Reservoir Storage	CDEC	Monthly Storage Data	• The data provides the current reservoir storage levels at GDPUD's only reservoir. • Data was retained for further consideration since data is used by GDPUD to establish drought response actions. Reservoir storage levels are observed by operators to establish drought response actions within GDPUD.
GFCSD Water Treatment Plant Reservoir Stage	GFCSD	Monthly Stage Data	• The data provides the current reservoir stage levels at GFCSD's only reservoir. • Data was retained for further consideration since data is used by GFCSD to establish drought response actions. Reservoir stage levels are observed by operators to establish drought response actions within GFCSD.

Table 2-1. Water Availability Data in the Planning Area, Continued

Data Set	Data Source	Data Type	Reason for Retaining Data for Further Drought Monitoring Consideration
Current Conditions, Continued			
Folsom Reservoir Storage	CDEC	Monthly Storage Data	• The data provides the current reservoir storage levels at Folsom reservoir. • Data was not retained for further consideration since Bulletin 120 unimpaired inflow (discussed below) was determined to be more indicative of seasonal water availability in the planning area, and there are no set indicators to monitor drought. Additionally, local drought actions have historically been more affected by water service contract cutbacks rather than solely Folsom Reservoir levels.
Cosumnes River at Michigan Bar	USGS	Monthly Discharge Data	• The data provides the current discharge for the Cosumnes to inform water supply conditions for the south portion of El Dorado County that is diverted from the Crawford Ditch. • Data was not retained for further consideration because there are no standard drought indicators for the Cosumnes River in the planning area. Also, trends in historical Cosumnes River conditions were found to be represented by the U.S. Drought Monitor.
Project 184 Reservoir Storage	USGS	Daily Storage Data	• The data provides the current total reservoir storage levels from Project 184 – Project 184 contains four storage reservoirs (Lake Aloha, Echo Lake, Silver Lake, and Caples Lake) that are part of EID operations. • Data was not retained for further consideration because Jenkinson Lake is EID's main storage reservoir and is more directly indicative of water supply. Additionally, historical total reservoir storage levels were found to have similar trends to Jenkinson Reservoir storage conditions and the U.S. Drought Monitor and are thus represented by those data.
Groundwater Elevations	CASGEM	Available Groundwater Well Elevations	• The data provides the current water table elevations for wells located within the planning area. • Data was not retained for further consideration because there was infrequent data for only one well in the planning area which would not be indicative of the entire planning area conditions.

Table 2-1. Water Availability Data in the Planning Area, Continued

Data Set	Data Source	Data Type	Reason for Retaining Data for Further Drought Monitoring Consideration
Near-Term Conditions (Forecast)			
Bulletin 120 Forecasted Unimpaired Inflow	CDEC	Forecasted Unimpaired Inflow to Folsom Reservoir	• The data provides insight on the potential upcoming water supplies available, which in turn helps determine the water year type and operating conditions of reservoirs. It is issued at least four times a year by DWR, in the second week of February, March, April, and May. • Data was retained for further consideration because it forecasts the volume of seasonal runoff from the state's major watersheds and directly ties to project water supplies.
National Weather Service	National Weather Service	Monthly Streamflow Volume for An Entire Year Each Month	• The data provides insight on the potential upcoming water supplies available. • Data was retained for further consideration because it can be used as a supplement when Bulletin 120 is not published (i.e., June to January).
Precipitation	NOAA	Likelihood of Precipitation	• The data provides the likelihood of precipitation throughout the U.S. and is depicted on a map of the U.S. – The 30-day forecast data is available monthly. Forecasts are released on the third Thursday of each month. • Data was not retained for further consideration because there is no planning area-specific tabulated forecast data available.
Snow Water Equivalent Data	USDA NRCS	Monthly Snow Water Equivalent Data	• The data provides snow water equivalent data from multiple gauges in the Sierra Nevada. • Data was not retained for further consideration because it showed very similar/duplicative trends to Bulletin 120. Since Bulletin 120 informs other water supply indices by the State, Bulletin 120 data was instead selected for further consideration.

Table 2-1. Water Availability Data in the Planning Area, Continued

Data Set	Data Source	Data Type	Reason for Retaining Data for Further Drought Monitoring Consideration
Recent Trends			
U.S. Drought Monitor	NDMC, USDA, and NOAA	Total Acreage Experiencing Various Levels of Drought Conditions	• A map/dataset is released every Thursday providing a weekly assessment of drought conditions, based on how much precipitation did or did not fall, up to the Tuesday morning before the map comes out. • Data was retained for further consideration because it accurately reflected historical drought conditions and severities in the planning area.

Key:
CASGEM = California Statewide Groundwater Elevation Monitoring
CDEC = California Data Exchange Center, Maintained by California Department of Water Resources
EID = El Dorado Irrigation District
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District
NDMC = National Drought Mitigation Center at the University of Nebraska-Lincoln
NOAA = National Oceanic and Atmospheric Administration
NRCS = Natural Resources Conservation Service
U.S. = United States
USDA = United States Department of Agriculture
USGS = United States Geological Survey

2.2 Indicators and Indices

As stated above, the planning area does not have any existing regional water supply indicators for drought monitoring purposes. Hence, existing water supply indicators for the retained data were assessed for their applicability to the planning area, on both an individual and aggregated basis. The development of a regional water supply indicator is to promote awareness of regional trends and is to supplement the existing ones of public water agency for their own specific actions and commitments.

The following criteria were considered when assessing the applicability of various indicators:

- Indicators should be based on readily available data.
- Indicators should be for data that is available year-around as conditions will be continually monitored.
- Indicators should accurately capture historical drought timing and severity.
- Indicators should be applicable on a region-wide basis.

The following sections summarize the data, associated indicators, and historical conditions considered.

2.2.1 EID's Jenkinson Lake Storage

Jenkinson Lake is a 41,000-acre-foot (AF) water supply reservoir owned and operated by EID. Current storage conditions of this reservoir are monitored to indicate potential drought actions for EID. Jenkinson Lake is considered a two-year supply, and thus the overall goal is to maintain a minimum of 25,000 AF year-round in Jenkinson Lake to guard against multiple year drought conditions. Historically, Jenkinson Lake typically fills and spills 95 percent of the years and, due to its elevation (about 3,400 feet above the sea level), is primarily fed by rainfall and not as reliant on snowpack to fill.

EID prepares an annual water supply and demand assessment to help inform water resource management decisions for the current year. This procedure is documented in their 2021 Drought Action Plan Update and incorporates numerous data sources used as evaluation criteria to forecast water reliability (i.e., water supply versus demand) for the current year and one subsequent dry year. These data sources include Project 184 reservoir storage, Project 184 pre-1914 water rights, Jenkinson Lake storage, Folsom Lake levels and CVP allocations, Water Right Permit 21112, Ditch/Weber Reservoir water rights, and recycled water production. EID staff determine whether drought actions are triggered based on precipitation outlooks, and whether Jenkinson Lake storage levels are decreasing from January to March and approaching the 25,000 AF storage level (EID 2015, EUD 2020). EID also reviews snowpack data and conducts their own snow surveys in the upper watersheds such as areas near Caples Lake to assess water conditions and to manage their upper basin reservoirs (Caples Lake, Echo Lake, Silver Lake, and Lake Aloha) to meet Federal Energy Regulatory Commission (FERC) license conditions and storage targets.

Table 2-2 shows when drought conditions occurred from 2000 to 2020 based on Jenkinson Lake conditions (i.e., January through March storage was nearing 25,000 AF and storage levels were decreasing). Drought conditions were indicated in nine years (i.e., 2000, 2001, 2006, 2011, 2012, 2014, 2015, 2017, and 2019) because reservoir storage levels decreased. Relatively speaking, EID has a higher level of water supply reliability based on their water supply and existing demand in their service area. While not available as a regular water supply source for other public water agencies or nearby OCA areas, storage levels of Jenkinson Lake could provide some insight about EID's potential capacity of emergency response actions for mutual aid or similar actions to other agencies or OCA. These potential actions will be explored in **Section 5**.

Table 2-2. Historical Occurrence of Drought as Indicated by El Dorado Irrigation District's Jenkinson Lake

Indicator	January - March Storage
	Near or below 25,000 AF and reservoir storage levels decreasing

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2000												
2001												
2002												
2003												
2004												
2005												
2006												
2007												
2008												
2009												
2010												
2011												
2012												
2013												
2014												
2015												
2016												
2017												
2018												
2019												
2020												

2.2.2 GDPUD's Stumpy Meadows Storage

Stumpy Meadows Reservoir is a 20,000 AF water supply reservoir owned and operated by GDPUD. For drought monitoring, GDPUD uses a series of indicators based on Stumpy Meadows Reservoir storage levels on the second week in April (GDPUD 2015).

Table 2-3 shows when drought conditions occurred according to GDPUD's indicators from 2000 to 2020. April storage was below 17,000 AF only twice over the 20 years, in 2014 and 2015. While these indicators are used to inform when GDPUD will take drought response actions, these indicators do not represent the entire planning area because the water stored in Stumpy Meadows Reservoir is only for GDPUD use and does not provide additional insight on the drought conditions for the remaining portions of the planning area. Additionally, due to the small size of the Stumpy Meadows Reservoir, there is limited potential capacity for emergency response actions for mutual aid or similar actions.

2.2.3 GFCSD's Water Treatment Plant Reservoir Stage

GFCSD's main water storage facility is their water treatment plant reservoir that has an active storage of 21.2 AF. For drought monitoring, GFCSD has a series of indicators that correspond to stage levels identified in the 2017 GFCSD Water Supply and Demand Update.

Table 2-4 shows when drought conditions occurred according to GFCSD's indicators from 2014[3] to 2020. Stage was below 10.6 AF three times, suggesting drought stressed conditions. While these indicators are used to inform when GFCSD will take drought response actions, these indicators do not represent the entire planning area because the water stored in Water Treatment Plant Reservoir is only for GFCSD use and does not provide additional insight on the drought conditions for the remaining portions of the planning area. Additionally, due to the small size of the water treatment plant reservoir, there is limited potential capacity for emergency response actions for mutual aid or similar actions.

[3] The analysis only considers data after completion of water treatment plant reservoir modifications.

Table 2-3. Historical Occurrence of Drought as Indicated for Georgetown Divide Public Utility District's Stumpy Meadows Reservoir

Indicator	2nd Week of April Storage	Percent of Storage
	> 17,000 AF	--
	< 17,000 AF	85%
	< 15,000 AF	75%
	< 13,000 AF	65%
	< 10,000 AF	50%

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2000												
2001												
2002												
2003												
2004												
2005												
2006												
2007												
2008												
2009												
2010												
2011												
2012												
2013												
2014												
2015												
2016												
2017												
2018												
2019												
2020												

Table 2-4. Historical Occurrence of Drought as Indicated for Grizzly Flats Community Services District's Water Treatment Plant Reservoir

Indicator	Stage
	> 10.6 ft
	< 10.6 ft
	< 9.6 ft
	< 6.75 ft

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2014												
2015												
2016												
2017												
2018												
2019												
2020												

2.2.4 Bulletin 120 Forecasted Unimpaired Inflow into Folsom Reservoir

Unimpaired inflow is runoff that would have occurred if water flow remained unaltered in rivers and streams instead of stored in reservoirs, imported, exported, or diverted. Unimpaired inflow is a measure of the total water supply available for all uses. Forecasted unimpaired inflow into Folsom Reservoir provides insight into future seasonal water supplies. The Sacramento Water Forum Agreement (2015 update) defined various year types based on the forecasted April-through-July unimpaired inflow into Folsom Reservoir. Other public water agencies downstream of Folsom Reservoir use unimpaired inflow as indicators to define actions to be taken to limit the impacts of dry conditions that correspond with the Sacramento Water Forum Agreement year types. As discussed above, Bulletin 120 publishes forecasted unimpaired flow (from April through July) into Folsom Reservoir typically four times a year and published in the second week of February, March, April, and May.

Table 2-5 shows monthly forecasted conditions from 2000 to 2020 based on Bulletin 120 data and the associated drought indicators. Dry or drought conditions were experienced in 2001, 2003, 2004, 2007, 2008, 2009, 2012, 2013, 2014, 2015, 2018, and 2020. The degree of severity varied, with the most severe dry conditions occurring in 2015 near the end of the most recent drought. While Bulletin 120 more accurately captures the gradual buildup of drought conditions compared to the reservoir storage data and appears more applicable on a regional scale, its lack of year around availability means that an additional data source would need to be used as a supplement.

Table 2-5. Historical Occurrence of Drought as Indicated by Bulletin 120's Forecasted Unimpaired Inflow into Folsom Reservoir

Indicator	Forecasted Unimpaired Inflow[1]	Water Forum Agreement Year Type
	> 950 TAF	Wet/Average
	< 950 TAF	Drier
	< 870 TAF	Drier
	< 650 TAF	Drier
	< 400 TAF	Driest

Notes: 1. Discretization beyond the Water Forum Agreement Year types was used for illustrative purposes and are based on indicators from City of Folsom's 2015 Urban Water Management Plan.
Key: TAF = thousand acre-feet

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2000												
2001												
2002												
2003												
2004												
2005												
2006												
2007												
2008												
2009												
2010												
2011												
2012												
2013												
2014												
2015												
2016												
2017												
2018												
2019												
2020												

2.2.5 U.S. Drought Monitor

The U.S. Drought Monitor is generated by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the National Oceanic and Atmospheric Administration, and the U.S. Department of Agriculture. The U.S. Drought Monitor looks backwards by performing weekly assessments of drought conditions based on how much precipitation did or did not fall, up to the Tuesday morning before the map comes out on Thursdays. The assessment considers data from the Palmer Drought Severity Index, Climate Prediction Center Soil Moisture Model, U.S. Geological Survey Weekly Streamflow, Standardized

Precipitation Index, and Objective Drought Indicator Blends. The U.S. Drought Monitor groups drought conditions into five classifications to represent the varying degrees of drought (**Table 2-6**). Every acre of land is assigned a classification weekly and is grouped by county. This data is used by State, local, federal, and tribal agencies to track drought. Some agencies may track drought using this data on a weekly basis seasonally or throughout the year, while other agencies refer to the data as need be when worried about potential drought conditions.

Table 2-6. Drought Classifications per the U.S. Drought Monitor

Indicator	Classifications	Description and Possible Impacts
1	D0- Abnormally Dry	• Areas may be going into or coming out of drought
2	D1- Moderate Drought	• Areas may have damage to crops and pastures • Streams, reservoirs, or wells may be low, and some water shortages may be developing or are imminent • Voluntary water-use restrictions may be requested
3	D2 - Severe Drought	• Crop pasture losses are likely • Water shortage is common • Water restrictions may be imposed
4	D3 - Extreme Drought	• Major crop/pasture losses likely • Widespread water shortages or restrictions likely
5	D4- Exceptional Drought	• Exceptional and widespread crop/pasture losses likely • Shortages of water in reservoirs, streams, and wells creating water emergencies are common

Table 2-7 shows the predominant monthly drought classification for the West Slope from 2000 to 2020. Based on these indicators and consistent with historical conditions, only one exceptional drought condition occurred during the recent 2012-2016 drought. Other less severe drought conditions occurred in the early and late 2000s. As can be seen in the table, droughts are historically a gradual occurrence and slowly increase in severity.

Table 2-7. Historical Drought Conditions in the West Slope of El Dorado County

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
2000												
2001												
2002												
2003												
2004												
2005												
2006												
2007												
2008												
2009												
2010												
2011												
2012												
2013												
2014												
2015												
2016												
2017												
2018												
2019												
2020												

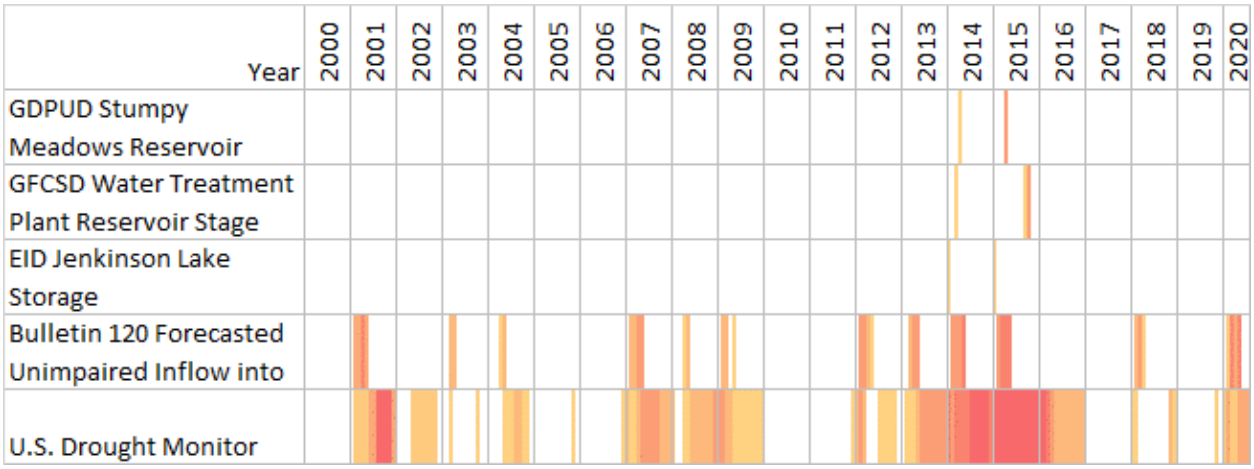
D0 - Abnormally Dry	D1- Moderate Drought	D2 - Severe Drought	D3 - Extreme Drought	D4 - Exceptional Drought

2.2.6 Occurrence of Drought Comparison Using Existing Drought Indicators

To assess the regional applicability of the abovementioned data indicators, the data were compared against each other as shown in **Figure 2-1. Figure 2-1** summarizes the historical drought events using the indicators for each retained data set described in **Table 2-1**. Less severe drought conditions are shown as lighter shades of yellow/orange. Data that indicated more severe droughts are represented by darker colors.

As it can be seen in the figure, the individual reservoirs (top three rows) showed only a few instances of droughts and did not show the gradual buildup of droughts as well as the other data. Those indicators were developed by individual public water agencies to inform when conditions are severe enough to require drought actions for their specific service area. Since the intention of the UARB RDCP drought monitoring is to inform early stages of droughts, other data and associated indicators should be used.

The Bulletin 120 forecasted unimpaired inflow to Folsom Reservoir and indicated droughts similar to the U.S. Drought Monitor but has only published typically four months of the year. To fill in the remainder of the data, another data source, such as those from the National Oceanic and Atmospheric Administration (see **Table 2-1**) would need to be used.



Key:
GDPUD = Georgetown Divide Public Utility District
EID = El Dorado Irrigation District
GFCSD = Grizzly Flats Community Services District

Figure 2-1. Comparison of Drought Occurrences Based on Reviewed Indicators

These findings were presented to the EC in September 2020, and it was agreed that the U.S. Drought Monitor data is appropriate to represent drought conditions throughout the planning area and that a composite index to aggregate multiple indices is not needed. Participants agreed the U.S. Drought Monitor is more applicable to the OCA drought conditions compared to individual public water agency reservoirs. In summary:

- The U.S. Drought Monitor and its associated indicators should be used to monitor drought and determine triggers and associated response actions.
- Individual agencies should continue to their use existing drought indicators and requirements for their specific system management.

2.3 Regional Triggers

The use of a regional water supply indicator will provide standard triggers/thresholds to inform the Agency when to initiate response actions. According to the Reclamation Drought Response Program Framework (2019), triggers are indicators or index values that can be used to define a specific drought stage, a specific response, or a mitigation action. Since the U.S. Drought Monitor was selected to represent drought conditions in the planning area, its existing drought indicators can be used to establish when drought response actions should be initiated by the Agency.

The Agency has long recognized the importance of having water resources information in El Dorado County be readily accessible to interested parties and the public. The Agency, in partnership with the County's Geographic Information System (GIS) unit developed **a GIS Portal** to disseminate information efficiently and effectively. Based on the UARB RDCP's recommendations, a dedicated Drought Monitoring application is being created using U.S. Drought Monitor data to provide early warning and recognition of when local drought conditions exist or are likely to occur at a local and regional scale.

At the September 2020 EC meeting, the EC members agreed that there should be three triggers:

1. **Severe Drought –** The trigger will occur when El Dorado County is first classified as a D2 per the U.S. Drought Monitor to provide early warning and prompt recognition of when local drought conditions exist or are likely to occur.
2. **Extreme Drought –** The trigger will occur when the El Dorado County is classified as a D3 per the U.S. Drought Monitor.
3. **Exceptional Drought –** The trigger will occur when El Dorado County is classified as a D4 per the U.S. Drought Monitor.

Table 2-8 summarizes the number of months that these three triggers have occurred in the West Slope over the last 20 years. Monitoring should be implemented in all years, regardless of the conditions from the previous year, but it is noted that consecutive dry periods are likely to be experienced prior to triggering response actions. How these triggers are used to inform regional response actions are described in **Section 5**.

Table 2-8. Summary of Triggers for Upper American River Basin Regional Drought Contingency Plan

Trigger	U.S. Drought Monitor Classification	Number of Months from 2000-2020
Severe Drought	D2	18
Extreme Drought	D3	12
Exceptional Drought	D4	18

3. Vulnerability Assessment

As experienced in the past, the West Slope is vulnerable during droughts, especially those in the OCA. Not only can vulnerabilities emerge, but existing vulnerabilities can be intensified. To reduce impacts from vulnerabilities during drought conditions the first step was to identify all vulnerabilities in the planning area followed by mitigation actions (**Section 4**) that are implemented long term along with response actions that are implemented as necessary (**Section 5**). This section describes the approach and outcomes of the vulnerability assessment for the risks and impacts of current and future droughts within the planning area.

3.1 Vulnerability Assessment Approach

Drought occurs when precipitation (over a season or longer) is insufficient in meeting the demands of both human activities and the environment, resulting in water shortage conditions. To address these current and future water supply reliability issues resulting from droughts, it is critical to identify drought-related vulnerabilities. For this plan, drought-related vulnerabilities were grouped into three sectors as shown in **Figure 3-1**.

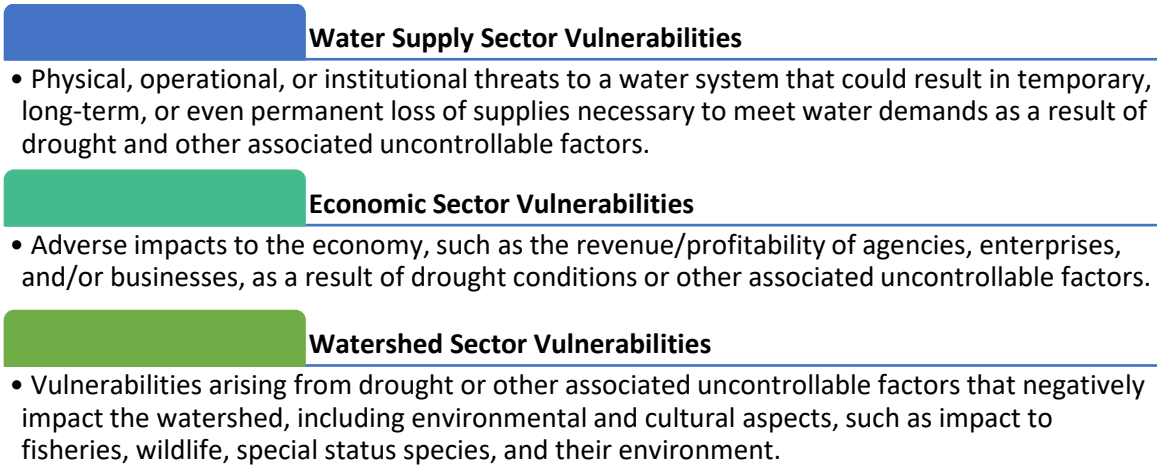


Figure 3-1. Drought-Related Vulnerabilities

To identify and define these vulnerabilities, the vulnerability assessment process included the following four steps:

1. **Develop a preliminary list of vulnerabilities by summarizing available information** gathered through a desktop assessment and literature review. Information sources included regional studies and planning documents as well as local public water agency information (e.g., RWA 2017, Lund et al. 2018, Agency 2019, CABY 2021, Reclamation et al. 2022). A preliminary list of vulnerabilities was developed by incorporating or adapting vulnerabilities identified in the desktop assessment. Only vulnerabilities resulting from drought and associated conditions were included, as this is the focus of the UARB RDCP.

2. **Review preliminary list of vulnerabilities with the EC** during the September 23, 2020, meeting. This review focused on water supply, economic, and watershed sector-related drought vulnerabilities and helped to confirm the accuracy and completeness of identified vulnerabilities.

3. **Review vulnerabilities with the DPTF members** based on their specific area of expertise. The updated vulnerability list was sent to the DPTF members for their review and comments received were incorporated into the list.

4. **Quantify the magnitude of water supply sector vulnerabilities for public water agencies** by assessing agency-specific information regarding projected current and future (i.e., 2070 under climate change conditions) available water supplies, storage capacities, production capacities, yields, demands, deliveries, etc. Data were primarily retrieved from regional planning documents (e.g., Agency's 2019 WRDMP, Reclamation's ARBS) and local agency reports (e.g., Urban Water Management Plans [UWMP], drought plans). This information was reviewed with each public water agency to confirm accuracy and completeness of information, fill data gaps, and identify any additional agency-specific water supply vulnerabilities and opportunities. The discussion materials are included in Appendix A and will remain in working draft status as information is preliminary and certain information has since been updated (e.g., UWMP 2020 updates).

3.2 Vulnerability Assessment Outcomes

This section describes the findings of the vulnerability assessment which evaluated the risks and impacts of current and future drought in the planning area. These vulnerabilities formed the basis for developing mitigation and response actions as described in subsequent sections.

3.2.1 Drought-Related Water Supply Sector Impacts

Droughts are characterized by drier than normal conditions, which result in reduced water supply reliability. The West Slope is particularly vulnerable to drought because it relies primarily on surface water and does not have a reliable source of alternative supplies. During drought events, surface water supplies and, consequently, reservoir storage levels are expected to decrease. For small water systems that depend on both surface water and groundwater supplies, droughts could exacerbate already declining groundwater levels.

Droughts increase the likelihood and severity of wildfires, which in turn cause some direct and indirect impacts on old infrastructure. In the West Slope, wooden flumes from the Gold Rush era and other delivery structures are particularly vulnerable to both direct impacts (i.e., destruction during a fire) and indirect impacts (i.e., damage from later mudslides and trees falling, originating at the burned site). These wooden flumes and unlined ditches, although not efficient due to having high volume of leaks, are major water conveyances in the West Slope, and interruption of water supply due to fire damage would be significant.

Regulatory actions or decisions during drought events could affect water supply reliability in the region. Curtailment orders for surface water diversions and mandatory conservation requirements imposed by public water agencies within the region could further constrain available water supplies. Some impacts

to surface water supplies may be related to operational decisions beyond the region's control, such as preferential releases from Folsom Reservoir (resulting in low storage levels) to maintain water quality in the Delta.

Drought may also affect the water quality of surface supplies in the West Slope. Reduced stream and river flows during drought periods can increase the concentration of pollutants or contaminants present. Reservoirs in forested areas are also susceptible to water quality impacts from wildfires, which reduces potable water quality via erosion events, increases runoff rates, and increases reservoir sedimentation.

3.2.2 Drought-Related Water Supply Sector Vulnerabilities

Water supply sector vulnerabilities may limit the ability to provide water (either locally or regionally) at a desired level of service during drought conditions. All other non-drought vulnerabilities were considered secondary for purposes of this evaluation due to the nature or scope of their impact and were not included in this assessment.

Of the twelve water supply sector vulnerabilities identified, three general themes surfaced as having the most significant impacts to drought resiliency in the planning area:

- **Water Availability** – Vulnerabilities related to public water agencies and the OCA water supplies that impact their ability to meet desired levels of service (i.e., demands).
- **Infrastructure** – Vulnerabilities related to water supply infrastructure that impact the ability to access and deliver sufficient water supplies during droughts or to share water supplies with neighboring areas in need.
- **Drought Planning** – Vulnerabilities that hinder the ability to appropriately prepare for and respond to droughts due to a variety of reasons such as a lack of readily available data, information, planning efforts, or staff and funding resources.

Table 3-1 illustrates, by theme, the key vulnerability pathways (how and why the vulnerabilities exist in the planning area). These key vulnerability pathways are the focal target of the subsequent mitigation actions to address or reduce their effects. The table also summarizes the resulting observed problem and the impacted agencies/parties.

Vulnerabilities under the water availability theme are largely influenced by external factors such as hydrology, hydrogeology, and climate change. These factors can directly (e.g., reduced snowpack) or indirectly (e.g., water quality) impact water supplies. These, in combination with planned growth, further exacerbate any water supply-demand imbalance that is expected in the future. Individual public water agencies typically have less control over vulnerabilities that are affected by external factors. Conversely, the vulnerabilities under the infrastructure and drought planning theme are due to internal/local factors that can be influenced by individual public water agencies. Vulnerabilities under the infrastructure theme are structural (i.e., physical) related and are exacerbated by the planning area's challenging foothill topography—which makes structural improvements difficult. Vulnerabilities under the drought planning theme are primarily institutional (e.g., policy) and most affect the OCA in the West Slope as it is not actively managed or serviced by a public water agency.

Table 3-1. Drought-Related Water Supply Sector Vulnerabilities

Theme	Pathway to Vulnerability	Observed Problem	Impacted Agencies/Parties
1. Water Availability	A. Reduced Surface Water Availability	**Reduced surface water/snowpack availability due to climate change**: Higher temperatures during winter are projected to cause more precipitation to occur as rainfall—causing increased runoff, less snowpack, and earlier spring snowmelt runoff. Earlier runoff leads to less snowmelt later in the season to recharge streams and maintain a reliable water supply. Moreover, increased evapotranspiration would lead to greater water losses.	Public water agencies (EID, GDPUD, and GFCSD) and Sacramento Municipal Utility District
		Variable surface water/snowpack availability due to changes in forest and chaparral vegetation from wildfires and forest management: Extensive forest canopies prevent snow from reaching the ground which leads to greater evaporation, in addition to consuming more water, thus reducing water supply availability. Similarly, overgrowth of chaparral communities at lower elevations (below the snowline) also causes increased evapotranspiration and reduced surface water availability.	Public water agencies (EID, GDPUD, and GFCSD) and SMUD
	B. Predominant Reliance on Surface Water	**Limited groundwater volume:** The limited volume of groundwater in the planning area inhibits it from being reliably used as a backup water supply during droughts. Consequently, the public water agencies in the planning area rely on surface water from the American River and Cosumnes River watersheds. Furthermore, some agencies lack redundancies in surface water supplies. While EID has multiple diversions and storage facilities, GDPUD and GFCSD each depend on a single reservoir for their water supplies. Moreover, GDPUD and GFCSD lack supply redundancies, such as non-potable sources, thus exacerbating the issue.	Public water agencies (EID, GDPUD, and GFCSD)

Table 3-1. Drought-Related Water Supply Sector Vulnerabilities, Continued

Theme	Pathway to Vulnerability	Observed Problem	Impacted Agencies/Parties
1. Water Availability (Continued)	C. Unreliable Fractured Rock Groundwater Supply	**Unreliable groundwater supply:** The OCA generally relies on groundwater that is largely restricted to fractured bedrock formations. The limited capacity and uncertainty surrounding these fractured rock aquifers—such as groundwater-surface water interactions and the hydraulic characteristics of the fissures—makes it difficult to predict how they might respond to drought conditions. Furthermore, warming conditions and the projected shift from less snowmelt to more rainfall are expected to reduce the supplies available for recharge.	OCA including small water systems
	D. Water Quality Impacts Due to Wildfires	**Water quality degradation:** Drought increases fuel loads, the probability of ignition, and the rate of fire spread. These conditions lead to an increasing frequency and intensity of wildfires which will result in both temporary and long-term water quality degradation on a landscape scale. Reservoirs in forested areas are susceptible to impacts from fire, which reduces potable water quality via erosion events, increases runoff rates, and increases reservoir sedimentation.	Public water agencies (EID, GDPUD, and GFCSD) and SMUD
2. Infrastructure	A. Limited Ability to Share Supplies	**Challenges to move water supply with existing infrastructure:** While some infrastructure exists for sharing supplies, it is insufficient to enable agencies or small water systems to share/receive supplies. Due to the foothill geography of the planning area, most new infrastructure is likely to have high costs (e.g., pumping up from Folsom Reservoir, adding pipeline between agencies), and may require complicated environmental compliance. Additionally, potential contract modifications may be needed to address any place of use/service area issues if infrastructure was in place to facilitate sharing.	Public water agencies (EID, GDPUD, and GFCSD) and OCA

Table 3-1. Drought-Related Water Supply Sector Vulnerabilities, Continued

Theme	Pathway to Vulnerability	Observed Problem	Impacted Agencies/Parties
2. Infrastructure (Continued)	B. Lack of Storage Capacity Due to Reliance on Snowpack	**Lack of regional reservoir storage capacity**: Previously, public water agencies in the region have relied on snowpack to act as a "reservoir." With decreasing snowpack predicted, reservoirs in this region (e.g., EID's Project 184) are not optimized for the predicted change in runoff timing from the watershed. The inability to store runoff—due to small reservoir sizes—limits the region's supplies and carryover capacity.	Public water agencies (EID, GDPUD, and GFCSD)
		Lack of in-district storage capacity: Limited reservoir storage reduces the potential for carryover storage capacity, especially during multi-year drought. Some smaller water agencies, such as GDPUD and GFCSD, have limited or no carryover storage (due to reliance on small tanks/ponds) and must curtail demand even during mild drought periods. Larger water agencies, such as EID, are less likely to be impacted by drought since its water system consists of multiple surface water storage facilities.	Some public water agencies (GDPUD and GFCSD)
	C. Reduced Access to Supplies Due to Aging Infrastructure and Management	**Conveyance losses:** Water conveyance in the region includes some earthen ditches, wooden flumes, deteriorating pipelines, and unlined canals that are prone to excessive water loss that exacerbate conditions during droughts.	Public water agencies (EID, GDPUD, and GFCSD)
		Existing reservoir inefficiencies: Historic water infrastructure design and management, coupled with rules in place for reservoir and other infrastructure operations, may not adequately respond to drought conditions. For example, not all stored water may be accessible in low storage conditions due to outlets being too high.	Public water agencies (EID, GDPUD, and GFCSD)

Table 3-1. Drought-Related Water Supply Sector Vulnerabilities, Continued

Theme	Pathway to Vulnerability	Observed Problem	Impacted Agencies/Parties
3. Drought Planning	A. Lack of Drought Planning in the OCA	**Lack of drought protection efforts:** Currently there are no known drought planning efforts for the OCA, except for EID provided bulk water stations, which were installed because of the 2007 drought planning effort. The lack of active drought mitigation planning increases small water systems' susceptibility to the effects of drought since water curtailments are likely to disproportionately impact disadvantaged communities. Also, proposed tightening of public water agency spheres of influence will result in less future OCA coverage and therefore will need their own drought planning.	OCA
	B. Lack of Data for the OCA	**Lack of data available:** There is limited data available on the demand, supply, and infrastructure for the OCA. This lack of data limits the ability to plan for and improve drought resiliency.	OCA

Key:
EID = El Dorado Irrigation District
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District
OCA = Other County Area (areas within the County General Plan Land Use Designations that are outside of existing public water agency service areas)
SMUD = Sacramento Municipal Utility District

Vulnerability Analysis for Public Water Agencies

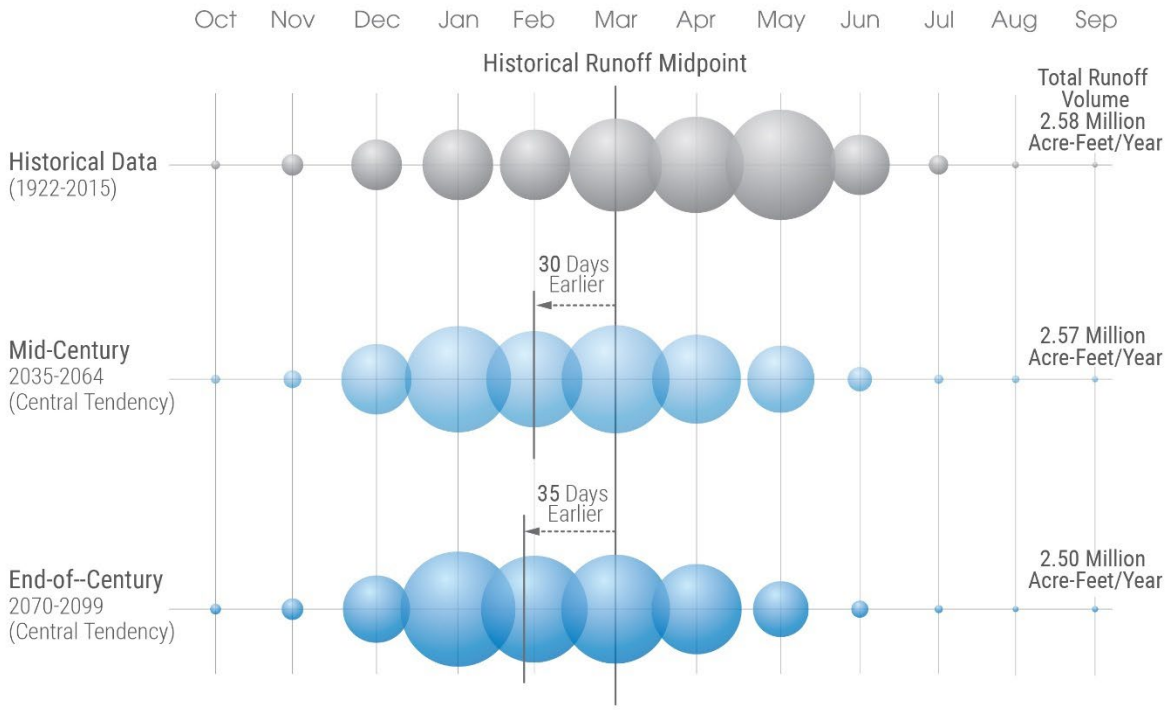
To better understand the potential magnitude of droughts on public water agencies, a water supply vulnerability analysis was performed. This analysis looked at conditions through 2070 to be consistent with the intention of this plan to develop long-term solutions considering future unknowns such as climate change. It is beyond the current 20-year planning horizons of the public water agencies. As such, the results presented below will differ from those developed for other planning documents such as UWMPs or similar documents. A vulnerability analysis was not carried out for the OCA as there was insufficient data for analysis.

The current and future hydrology used in this analysis was from the ARBS (Reclamation et al. 2022). The ARBS projects that climate change is expected to reduce snowpack, the primary source of water in El Dorado County, because of more precipitation falling as rain instead of snow. Increases in temperature will increase agricultural and urban outdoor water needs. More importantly, the seasonal distribution of precipitation will shift – the runoff midpoint (when 50 percent of the total annual runoff has occurred) may shift from March to between 30 and 35 days earlier in the mid-century and end-of-century projections (**Figure 3-2**) (Agency 2019, Reclamation et al. 2022). This shift will result in "flashier" hydrology that could overwhelm the existing facilities that were designed and are operated according to the historical hydrology. For EID and GDPUD's analysis, the ARBS's results for Year 2070 under the Central Tendency climate change trend[4] was used.

The current and future demands for EID and GDPUD were also from the ARBS (Reclamation et al. 2022). The ARBS demands assumed land use capacity-level development, which may be more than what is projected in other planning documents with a shorter planning horizon. M&I future demand was based on the current County General Plan land use forecasts and current water use intensity. Future agricultural demand assumes the maximum agricultural footprint that could be developed based on the total demand for West Slope crops.[5]

[4] An ensemble approach to climate change impact assessments is standard and accounts for the effects of simulated changes influenced by assumed adaptation and differences in various, Global Circulation Models. The central tendency represents the center (median) of the range of projected change in precipitation and temperature.

[5] Note, for some areas in the West Slope, this may be an overestimation as the cost of developing native land for agricultural production may be prohibitively expensive for some lower-value crops.



Source: Reclamation et al. (2022), preliminary information

Figure 3-2. Projected Change in Seasonal Distribution of Precipitation

The current and future hydrology and demands for GFCSD were based on the Agency's 2014 WRDMP, the M&I Water Demand Review (Agency 2020c), and GFCSD's 2017 Water Supply and Demand Update. Annual M&I demand estimates were extrapolated from capacity demand using various demand factors and were distributed monthly based on historical (average 2011 to 2013) deliveries. GFCSD's M&I supplies were based on the current and projected annual safe yield.

Furthermore, this analysis assumed a scenario where supplies were highly restricted to reflect a severe supply disruption situation where a public water agency's primary water supply becomes unavailable for an extended duration. This scenario is beyond what is required to be planned for in other local documents such as UWMPs and represents dire drought conditions.

This highly restricted supply scenario may require "extraordinary conservation" to meet demand. The level of this extraordinary conservation varies by public water agency and by end use. EID's UWMP and Drought Plan and GFCSD's Drought Plan call for a 15 percent demand reduction for M&I and agricultural uses under Stage 1 Drought Conditions.[6] Alternatively, GDPUD's UWMP and Drought Plan calls for a 10 percent reduction for M&I use and a 50

Extraordinary conservation is mandatory or voluntary short-term conservation in place during severe droughts and beyond typical water conservation requirements by law and regulations. It could be voluntary as a public water agency's progressive measure, or it could be implemented under a state or local drought emergency declaration. Under California Water Code §353, public water agencies have the authority to declare emergency water shortage conditions and associated restrictions.

[6] Drought stages (e.g., Stage 1) are enacted when water supplies decrease below normal conditions and generally include a corresponding response action, such as voluntary or mandatory conservation measures, that is dependent on the severity of the water supply restriction. These stages and associated actions are discussed further in Section 5.

percent reduction for agricultural use under Stage 1 Drought Conditions. These levels of conservation were used for the highly restricted supply scenario.

Table 3-2 depicts the annual M&I and agricultural demands and simulated deficit for each public water agency under current and projected conditions. As noted above, these results will vary from those developed in UWMPs or similar documents due to the differences in assumptions listed above related to demand, hydrology, and planning horizons.

Table 3-2. Simulated Annual Demand and Deficits After Extraordinary Conservation by Public Water Agency and Water Use Type for a Highly Restricted Supply Scenario[1] Under Current and 2070 Projected Conditions

	Current Conditions			Projected Conditions (2070)			
	Total Demand (acre-feet)	Deficit (acre-feet)	Deficit (%)	Total Demand (acre-feet)	Extraordinary Conservation (acre-feet)[2]	Deficit (acre-feet)	Deficit (%)
Public Water Agency							
El Dorado Irrigation District							
M&I Use	36,472	0	0%	56,251	8,438	14,327	25%
Agricultural Use	2,642	0	0%	21,480	371	18,258	85%
Georgetown Divide Public Utility District							
M&I Use	2,868	0	0%	8,922	892	0	0%
Agricultural Use	6,390	0	0%	11,120	5,560	656	6%
Grizzly Flats Community Services District							
M&I Use	105	0	0%	217	33	31	14%

Source: Data compiled from Reclamation et al. 2022, Agency 2014, Agency 2020c, and GFCSD 2017.
Key: M&I = Municipal and Industrial
Note:
1. This analysis goes beyond the requirements of Urban Water Management Plans and similar documents. This analysis assumed capacity-level development demands and hydrology with climate change projections developed for the American River Basin Study (Reclamation et al. 2022). As such, results will vary with other existing planning documents.
2. Assumes Stage 1 Drought reductions are in place consistent each public water agencies' drought plan.

Based on this analysis, under current conditions, all three public water agencies can meet demand during the highly restricted supply scenario. Under projected conditions, all three agencies are expected to experience some water supply-demand imbalance—even after employing extraordinary conservation measures (i.e., implementing Stage 1 drought measures). EID's large agricultural use deficit (85 percent) is largely attributed to a potential increase in demand without a concurrent increase in future supplies. GDPUD is expected to be able to meet projected M&I demand with implementation of extraordinary conservation measures. GDPUD is simulated to experience a small agricultural deficit even after extraordinary conservation (i.e., 50 percent decrease in demand). GFCSD is expected to experience a water supply-demand imbalance for M&I use after extraordinary conservation. The greatest deficits for all three public water agencies tend to occur during warmer months when demand is highest.

3.2.3 Drought-Related Economic and Watershed Sector Impacts

Prolonged drought periods have economic, environmental, and cultural impacts. These impacts may be due to reduced water availability or could be associated with the destruction caused by catastrophic wildfires—which increase in probability during these drier than normal periods.

Wildfire damages and suppression costs have risen continuously over time. And the frequency, size, and intensity of these fires are expected to grow. Loss of life and structures as a direct or proximate result of wildfires is at an all-time high. Economic impacts associated with wildfires may include costs to homeowners due to loss of residential landscaping, degradation of urban environments due to loss of landscaping, agricultural land fallowing and associated job loss, degradation of fishery habitat and associated job loss, and tree mortality with damage to forest ecosystems.

Additional economic impacts may result from mandatory conservation requirements beyond those needed to ensure water supply for the region's needs; this results in significant revenue impacts for public water agencies that threaten long-term reliability of supply by reducing funds available to maintain water systems.

Prolonged drought conditions have caused pervasive tree mortality across the Central and Southern Sierra Nevada. It is estimated that over 129 million trees have died across the state since 2010, and this number continues to grow. El Dorado County is not immune to this epidemic and declared an emergency for unprecedented tree mortality in March of 2016 due to drought conditions and related bark beetle infestations. The emergency declaration is still in effect today.

Drought conditions increase erosion in land and along streams, where many cultural activities and sacred sites are located. This erosion poses threats to medicinal and culturally important plants and animals, impacts burial grounds, and affects other cultural or historically traditional resources.

3.2.4 Drought-Related Economic and Watershed Sector Vulnerabilities

Beyond the water supply sector, economic and watershed sectors were identified as being vulnerable to the effects of drought and reduced water supply. **Table 3-3** illustrates, by theme, the key vulnerability pathways (how and why the vulnerabilities exist in the planning area). The table also summarizes the resulting observed problem and the impacted agencies/parties.

Table 3-3. Drought-Related Economic and Watershed Sector Vulnerabilities

Theme	Pathway to Vulnerability	Observed Problem
4. Economic Sector	A. Non-Mitigatable Unreliable Agricultural Water Supply	Decreased water supply (and increased water demands for certain soil conditions) could result in diminished crop production and reduced forage/water for livestock, ultimately leading to revenue losses for the agricultural and ranching industry. This could also lead to fewer employment opportunities for agricultural workers. Moreover, worsening drought conditions may reduce new agricultural planning, investment, and expansion in the planning area.
	B. Reduced Revenue for Agrotourism During Droughts	Decreased water supply could result in diminished crop production (or possibly farm/ranch closures), decreased visitors, and subsequently a reduction in agrotourism revenue.
	C. Increased Risk of Catastrophic Wildfires During Droughts	The occurrence of forest fires and the amount of area burned is correlated to changes in forest management practices over the past few decades and recent or ongoing drought conditions—as seen during the 2021 Caldor Fire, a federally-declared disaster. These catastrophic wildfires take a large economic toll on communities through property losses, decreased tourism (e.g., closure of parks and recreation areas), and by straining emergency services.
	D. Reduced Snowpack, River Flows, and Reservoir Storage Levels Limit Recreational Opportunities	Many recreational activities in the study area rely on sufficient snow cover or water supplies being available. In the winter, low snowpack reduces the number of opportunities for skiing, snowboarding, snowmobiling, etc. In the summer, reductions in river flows and reservoir storage levels disrupt fishing, rafting, swimming, camping, and other recreational activities throughout the region. Both scenarios could lead to a loss of recreational revenue.

Table 3-3. Drought-Related Economic and Watershed Sector Vulnerabilities, Continued

Theme	Pathway to Vulnerability	Observed Problem
4. Economic Sector (Continued)	E. Reduced River Flows and Reservoir Storage Levels Shift Timing of Hydropower Generation	Reductions in river flows and upper reservoir storage levels could result in shifts in timing and quantity of hydroelectric generation (which is also dependent on flow release requirements of Federal Energy Regulatory Commission licenses for the projects). During drought conditions, some reservoirs may be limited to releasing water during morning hours to provide sufficient streamflow for recreation, thus generating when power demands and thereby prices are lower. Also, it may result in a shift to generating hydropower in lower priced seasons when more water is likely available. The severity of this vulnerability varies; for example, EID and SMUD both have some flexibility during droughts to accumulate power water during the day/night while releasing when power is needed. However, some power plants primarily rely on run of the river flows which would likely result in a net loss of energy generated during a drought.
	F. Reduction In M&I Water Use (Voluntary or Mandatory) During Droughts	During droughts, M&I demand has historically decreased either due to voluntary or mandatory reductions. This could lead to loss of revenue for M&I water suppliers.
	G. Reduced Water Supplies Leads to Timber Market Losses	Droughts can negatively impact forest inventories by increasing mortality and/or by reducing growth. A decrease in forest inventories could result in mill closures (if local industries are unable to successfully expand their procurement zones), ultimately leading to fewer employment opportunities.
5. Watershed Sector	A. Lack of Water and Healthy Soils to Maintain Native Plant Health and Diversity	Drought conditions would reduce the water supply available in soils, leading to metabolic stress, hydraulic failure, and reduced nutrient uptake for native plant species. These conditions create stress for native conifer species in higher elevations, making them more susceptible to insect damage (e.g., bark beetles) and disease, resulting in tree mortality and an increased threat of catastrophic wildfire. Drought conditions in the oak woodland and foothill ecoregion create stress for oaks and grassland species, which in turn increases the threat of catastrophic wildfire. Moreover, these conditions could create habitat favorable for invasive species, thus decreasing native plant diversity in the watershed.

Table 3-3. Drought-Related Economic and Watershed Sector Vulnerabilities, Continued

Theme	Pathway to Vulnerability	Observed Problem
5. Watershed Sector (Continued)	B. Increased Erosion Due to Drought Impacts Cultural Resources	Drought conditions increase embankment erosion on the American River and its tributaries. This erosion limits access to culturally significant plants, impacts burial grounds, and affects other cultural resources.
	C. Insufficient Instream Flows Decrease Fish Population Productivity	Drought conditions could result in a reduction of flows and an increase in water temperature, reducing fish habitat quantity and quality for salmonids in the lower American River and Cosumnes River. Moreover, the sensitivity of salmonids to elevated water temperatures could lead to thermal stress and decreased population productivity.
	D. Insufficient Instream Flows for Wildlife	Drought conditions would reduce the amount of water supplies and climate refugia available for native wildlife, such as special status species and those whose life cycles require water (e.g., amphibians) to survive. This includes large areas of habitat in the planning area for the federal Endangered Species Ac-listed California red-legged frog and Sierra Nevada yellow-legged frog.
	E. Water Quality Impacts Due to Shifts in Streamflow	Drought conditions are expected to impact water quality both directly and indirectly. Shifts in timing of flow concentrate nutrients and sediment and can lead to an increase in water temperatures. Indirect effects include a combination of terrestrial, riparian, and instream processes that impact sediment and nutrient concentrations and fluxes.
	F. Lack of Wetlands Protection	Drought conditions could impair and degrade riparian, meadow, and other wetland habitats, thus endangering the population of plant and animal species that depend on wetlands.
	G. Declining Ecosystem Health	Drought conditions could reduce the abundance of native wildlife that are culturally significant to many local indigenous communities such as the Miwok, Nisenan, Maidu, and Washoe tribes. Historically, salmon, reptiles, and plants have been used by these tribes for food, medicine, and tools (e.g., baskets).

Key:
EID = El Dorado Irrigation District M&I = Municipal and Industrial SMUD = Sacramento Municipal Utility District

Reduced snowpack and shifts in streamflow timing, and consequently water supplies, are the primary drivers behind the economic and watershed sector vulnerabilities associated with drought. These drivers lead to impacts that are associated with multiple interrelated and compounding vulnerabilities across both sectors. For example, a reduction in snowpack could lead to stress in native conifer species, which in turn reduces overall forest health and could contribute to timber market losses. Consequently, these changes to forest health could impact runoff characteristics that negatively impact instream ecological processes while also reducing hydropower generation due to shifts in timing of streamflow. Many of the interrelated vulnerabilities identified in **Table 3-3** emphasize the need for a holistic approach to ecosystem management that will help increase regional resiliency for both the economic and watershed sectors. While the watershed sector vulnerabilities were not quantified in the UARB RDCP, it is important to qualitatively evaluate their impact for this holistic approach to planning.

The water supply and other sector vulnerabilities discussed in these sections will form the basis for developing mitigation and response actions (**Section 4**).

4. Mitigation Actions

Based on the wide range of water supply, economic, and watershed-related vulnerabilities, there are many mitigation actions that need to take place to even begin to improve overall reliability during droughts. Mitigation actions are projects, activities, or processes taken to reduce or eliminate long-term impacts from drought conditions. The Agency recognized that not all vulnerabilities can be solved immediately given limited resources, but that those actions with the greatest benefit or addressing the most pressing need should be prioritized. As such, this section the process for identifying, screening, evaluating, and prioritizing mitigation actions and activities that can improve the planning area's resiliency in the face of drought conditions. In addition, because of the ongoing drought conditions, the Agency already took steps to begin coordination and implementation of some mitigation actions, especially those related to the OCA and lack of data availability.

4.1 Approach for Mitigation Actions Analysis

Mitigation actions were developed to address the vulnerabilities listed in **Tables 3-1** and **3-3** (see **Section 3**). The steps for developing mitigation actions included the following activities and are graphically illustrated in **Figure 4-1**:

1. **Identify Mitigation Actions** – A potential range of mitigation actions and opportunities were identified from existing regional plans and studies.
2. **Screen Identified Mitigation Actions** – The purpose of this screening was to eliminate mitigation actions through a red flag/critical flaw analysis.
3. **Evaluate Retained Mitigation Actions** – The screened mitigation actions were further evaluated to assess contributions to drought resiliency, long-term durability, watershed health and ecosystem functions improvements, water equity, and regional effectiveness.
4. **Prioritize Evaluated Mitigation Actions** – The evaluated mitigation actions were grouped based on their ability to address the goals/objectives of the UARB RDCP.

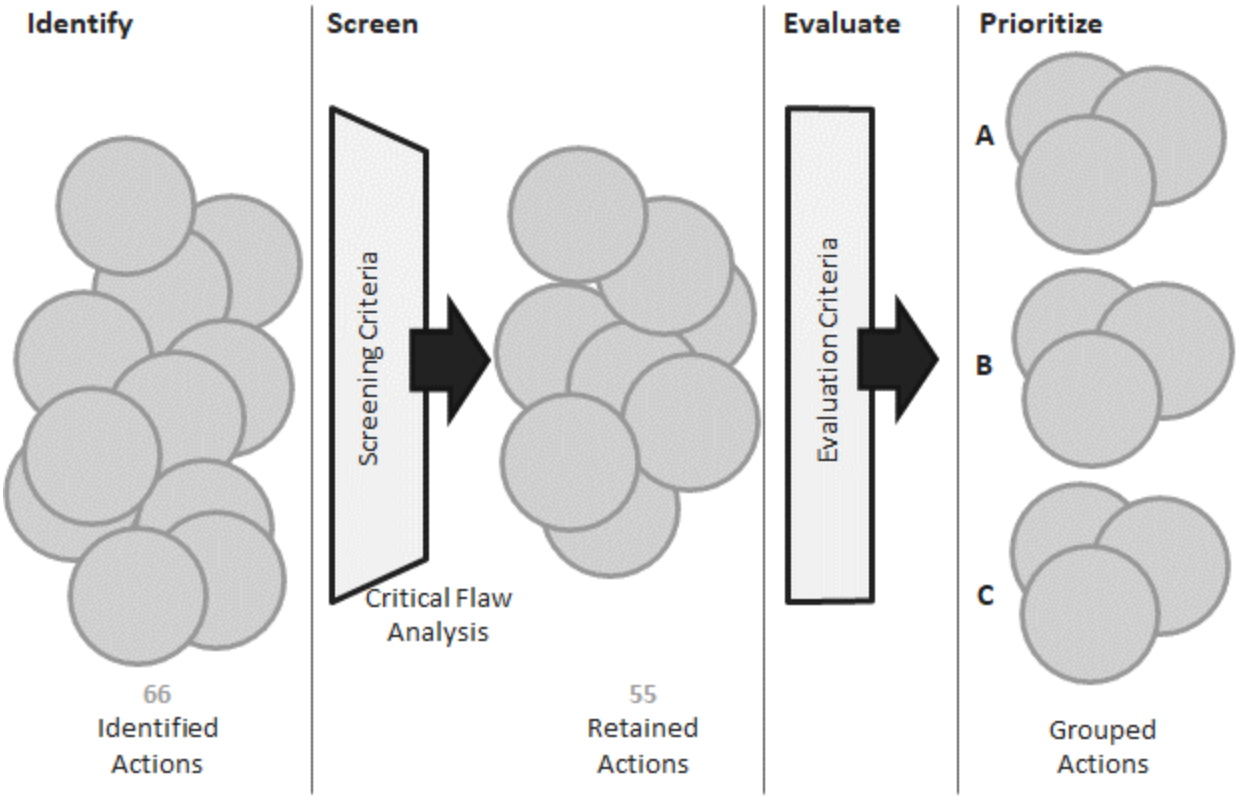


Figure 4-1. Approach for Mitigation Action Analysis

4.2 Identification of Mitigation Actions

Mitigation actions are intended to address the drought-specific vulnerabilities identified by the EC and the DPTF listed in **Section 3**. Mitigation actions can range from structural actions (e.g., construct interties or wells) to non-structural (e.g., institutional, collaborative) actions. The initial list of mitigation actions was compiled from the following existing regional plans and studies:

- 2021-2025 El Dorado Water Agency Strategic Plan (Agency 2020d)
- Cosumnes, American, Bear, Yuba Integrated Regional Water Management Plan (CABY 2021)
- American River Basin Study (Reclamation et al. 2022)
- Water Resources Development and Management Plan (Agency 2019)
- North American Basin Regional Drought Contingency Plan (RWA 2017)
- Georgetown Divide Public Utility District Urban Water Management Plans (GDPUD 2015, 2020)
- El Dorado Irrigation District Urban Water Management Plans (EID 2015, 2021)
- El Dorado Irrigation District Integrated Water Resources Master Plan (EID 2013)
- Georgetown Divide Public Utility District Options to Increase Water Supply (GDPUD 2009)

- El Dorado County Water Agency Drought Plan (Agency 2007)
- El Dorado County Local Hazard Mitigation Plan (County 2019)

The initial list of mitigation actions was used as a starting point for the EC and DPTF to review. The EC first reviewed the list of mitigation actions at the EC meeting on January 27, 2021 and identified if the mitigation actions could help address the identified vulnerabilities. The actions, to various degrees, addressed the wide range of the drought-specific vulnerabilities. The DPTF also reviewed the updated list of mitigation actions and provided additional feedback via Google Forms on whether there were any outstanding mitigation actions that should be included. Throughout this process, a total of 66 mitigation actions were identified. During this process, cost, yield, and basic project data were collected if available but no analyses were performed.

4.2.1 Screening of Identified Mitigation Actions

The purpose of this screening step was to identify a retained set of mitigation actions for further evaluation. It identified any red flags or critical issues associated with each mitigation action and then removed those mitigation actions from further consideration. The screening process did not assess specific components of each mitigation actions. The identified mitigation actions were screened based on the following:

- **Provides benefits during droughts –** Only actions that can specifically provide benefits during droughts were retained.
- **Provides benefits within planning area –** If a mitigation action provides benefits to the planning area, it was retained.
- **Addresses identified vulnerabilities –** The mitigation actions must address at least one of the identified vulnerabilities to be retained.
- **Is not already implemented –** Only mitigation actions that were in the conceptual, planning, or design phase were retained. If an action was under construction or already implemented, it was removed.
- **Is not a redundant action –** Actions that were similar in scope were combined or removed if repeated.

The screening effort removed 11 mitigation actions using the criteria above, thus retaining 55 of the 66 mitigation actions.

4.2.2 Evaluation of Retained Mitigation Actions

The 55 retained mitigation actions were further evaluated to inform which actions best meet the goals of the UARB RDCP. This was completed using a set of qualitative evaluation criteria to provide a consistent framework for evaluating and comparing the mitigation actions. Data that informed the evaluation was compiled using available plans and studies and through input from participating agencies.

The mitigation actions were evaluated separately based on the five qualitative evaluation criteria shown in **Figure 4-2**. The evaluation criteria used qualitative data and did not involve detailed hydraulic analysis for facility planning, or detailed operation modeling. For each criterion, a score of 0 (no benefit) to 3 (highest benefit) was assigned based on the mitigation action's ability to accomplish/support each criterion. This score is termed level of accomplishment. **Table 4-1** provides a description of the evaluation criteria and the qualifying characteristics or description associated with each level of accomplishment.

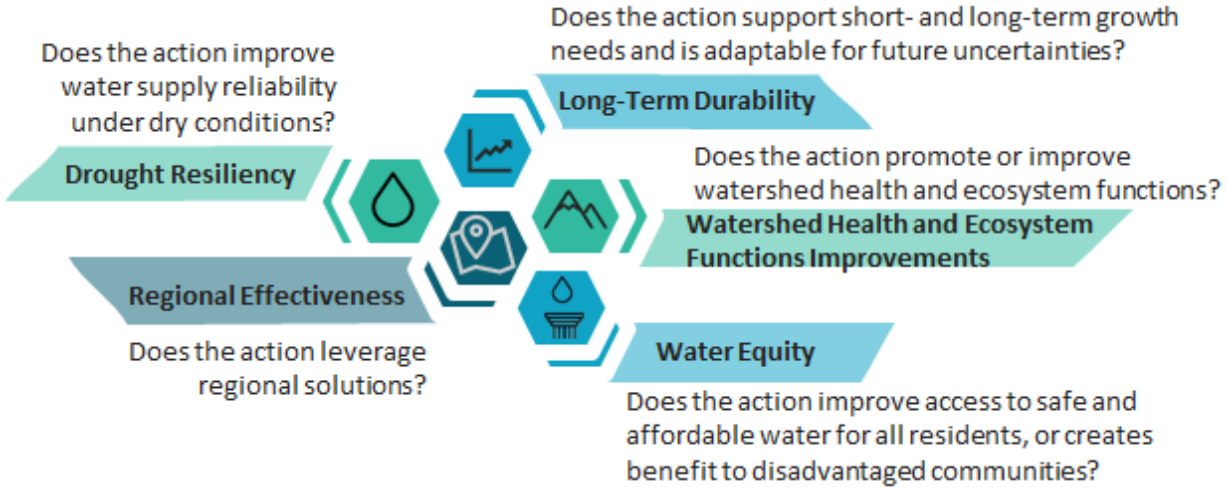


Figure 4-2. Evaluation Criteria Prioritizing Retained Mitigation Actions

Table 4-1. Evaluation Criteria and Qualifying Characteristics

Evaluation Criteria	Description	Level of Accomplishment	Qualifying Characteristics
Upper American River Basin Goals Evaluation Criteria			
Drought Resiliency 	Qualitatively assesses the ability of action to achieve and maintain water supply reliability (i.e., provide desired level of service) under dry conditions.	3	**High ability** to provide desired level of service during drought or emergency conditions
		2	**Moderate ability** to provide desired level of service during drought or emergency conditions
		1	**Limited or indirect ability** to provide desired level of service during drought or emergency conditions
		0	**None or adverse impact results**, does not provide desired level of service during drought, or beyond scope of drought contingency plan, or worsens conditions
Long-Term Durability 	Qualitatively assesses the ability of action to meet both short-term and long-term growth needs and providing flexibility to address uncertainty associated with economic growth and greater societal influencing factors (e.g., COVID-19 pandemic).	3	**High ability** to meet both short-term and long-term growth needs and providing flexibility to address uncertainty associated with economic growth and greater societal influencing factors
		2	**Moderate ability** to meet both short-term and long-term growth needs and providing flexibility to address uncertainty associated with economic growth and greater societal influencing factors
		1	**Limited or indirect ability** to meet both short-term and long-term growth needs and providing flexibility to address uncertainty associated with economic growth and greater societal influencing factors
		0	**None or adverse impact results**, does not provide ability to meet both short-term and long-term growth needs and providing flexibility to address uncertainty associated with economic growth and greater societal influencing factors, worsens conditions

Table 4-1. Evaluation Criteria and Qualifying Characteristics, Continued

Evaluation Criteria	Description	Level of Accomplishment	Qualifying Characteristics
Regional Efficiency	Qualitatively assesses the ability of action to leverage regional solutions to improve resiliency for multiple agencies in a cost-efficient matter.	3	**Provides multi-agency benefits** (>2 agencies) or regional benefits (e.g., countywide)
		2	**Provides benefits to 2 agencies or semi-regional benefits**
		1	**Provides benefits to 1 agency, or only localized benefits**
		0	**Provides no or adverse benefits** to any agency
Water Equity	Qualitatively assesses the ability of action to improve access to safe and affordable water for disadvantaged communities.	3	Improves access to safe and affordable water to a **Severely Disadvantaged** or **Tribal Community**
		2	Improves access to safe and affordable water to a **Community with Income below 2 Times Federal Poverty Level**
		1	Improves access to safe and affordable water to a **Disadvantaged Community**
		0	**None or adverse impact results**, does not improve access to safe and affordable water to disadvantaged communities or worsens conditions
Watershed Health and Ecosystem Functions Improvements	Qualitatively assesses the ability of action to promote or improve watershed health and ecosystem functions.	3	**High ability** to improves watershed conditions or promotes sustainability (e.g., restores land to natural terrain, uses green infrastructure)
		2	**Moderate ability** to improve watershed conditions or promote sustainability (e.g., reduces reliance on instream flows during droughts)
		1	**Limited or indirect ability** to improve watershed conditions or improve sustainability
		0	**None or adverse impact results**, does not improve watershed conditions or improve sustainability, worsens conditions

Note that the Water Equity criterion is based on the State Human Right to Water Legislation, Assembly Bill (AB) 685. AB 685 was signed into law by Governor Jerry Brown in 2012 to affirm that every person in the State has the right to clean, safe, affordable, and accessible water adequate for human

consumption, cooking, and sanitary purposes. The legislation directs all State agencies, including the California Department of Water Resources (DWR), the State Water Resources Control Board (State Water Board) and the State Department of Public Health, to consider the human right to water when revising, adopting, or establishing policies, regulations, and grant criteria pertinent to water uses. The State has since added more regulatory authority and more funding to help small disadvantaged or severely disadvantaged community water systems.

Evaluation Criteria Weights

Table 4-2 shows the evaluation criteria weights developed to help identify the mitigation actions that best meet the priorities and goals of the UARB RDCP. Weights were used as they provide the relative importance for the evaluation criteria based on the goals of the UARB RDCP and EC input. On January 27, 2021, each EC attendee ranked the evaluation criteria from most important to least important. From this exercise the EC ranked Drought Resiliency and Long-term Durability equally high because the mitigation actions that score high on these criteria have the highest likelihood in reducing drought impacts and providing benefits on a long-term scale while considering future conditions (e.g., population growth, climate change, future regulations). Regional effectiveness ranked the lowest because, with the planning area's topography and the rural way of life, there are limited opportunities to provide benefits to the entire planning area. The EC agreed that regional effectiveness should have little to no weight compared to the other evaluation criteria. Given these results, the weights shown in **Table 4-2** were developed to reflect the sentiment of the EC. A sensitivity analysis was performed to see how the grouping varied if all evaluation criteria were equally weighted. A few mitigation actions moved up or down by one grouping (e.g., A to B or C to B), and only one mitigation action moved two groupings (A to C). Most mitigation action groupings did not significantly alter. The results based on the below weights were confirmed by the EC and DPTF, as described in the subsequent section.

Table 4-2. Evaluation Criteria Weights

Evaluation Criteria	Weight
Drought Resiliency	35%
Long-Term Durability	35%
Regional Effectiveness	5%
Water Equity	10%
Watershed Health and Ecosystem Functions Improvement	15%
TOTAL	100%

Note: Weights were developed based on the Executive Committee's input on the relative ranks of the evaluation criteria during the January 2021 meeting.

4.2.3 Prioritization of Evaluated Mitigation Actions

Once each mitigation action was evaluated using the evaluation criteria outlined in **Section 4.2.2**, the mitigation actions were prioritized into three groupings using the method described below. The results of the prioritization process identify mitigation actions that will have the highest ability to address the UARB RDCP goals/objectives in mitigating drought conditions at a regional level.

1. **Sum Weighted Scores from Evaluation Criteria –** The mitigation action weighted score was the sum of each evaluation criteria score multiplied by its respective weight.

2. **Assign Grouping –** After the weighted scores were calculated, the mitigation actions were assigned an A, B, or C grouping. Mitigation actions in the "A" group were those receiving a score in the top third, "B" group mitigation actions were the middle third scores, and "C" group mitigation actions were the bottom third scores. "A" group mitigation actions typically have the highest ability to address the UARB RDCP goals/objectives, "B" group mitigation actions have a moderate ability to address the UARB RDCP goals/objectives, and "C" group mitigation actions have a lower ability to address the UARB RDCP goals/objectives.

The prioritization results and weighted scores were reviewed and confirmed by both the EC and DPTF at the March 26, 2021, meeting.

4.3 Outcomes From Mitigation Action Evaluation

This section provides a summary of the mitigation action evaluation. The 55 retained mitigation actions consist of 25 structural (physical) actions and 30 non-structural (institutional) actions. Mitigation actions were grouped into structural actions (e.g., construct interties or wells) or non-structural actions (e.g., institutional, collaborative, etc.) to differentiate the nonstructural policy, operational, or institutional changes/actions from physical needs or construction projects. Additionally, funding mechanisms for non-structural actions are different than physical actions, and quantification of benefits between the types of actions are also different. Within the structural and non-structural groupings, these actions were subdivided into categories based on their ability to address drought resiliency based on the vulnerabilities identified. **Figure 4-3** shows the number of mitigation actions that fall into each category along with a description on how they provide benefits to drought resiliency.

4.3.1 Prioritization Results

Table 4-3 provides a summary of the retained structural mitigation actions prioritized into Groups A, B, or C. **Table 4-4** provides a summary of the retained non-structural mitigation actions prioritized into Groups A, B, or C. As stated above, mitigation actions that fall into Group A are anticipated to have the highest ability to address the UARB RDCP goals/objectives, or in other words can provide the greatest drought-related benefits.

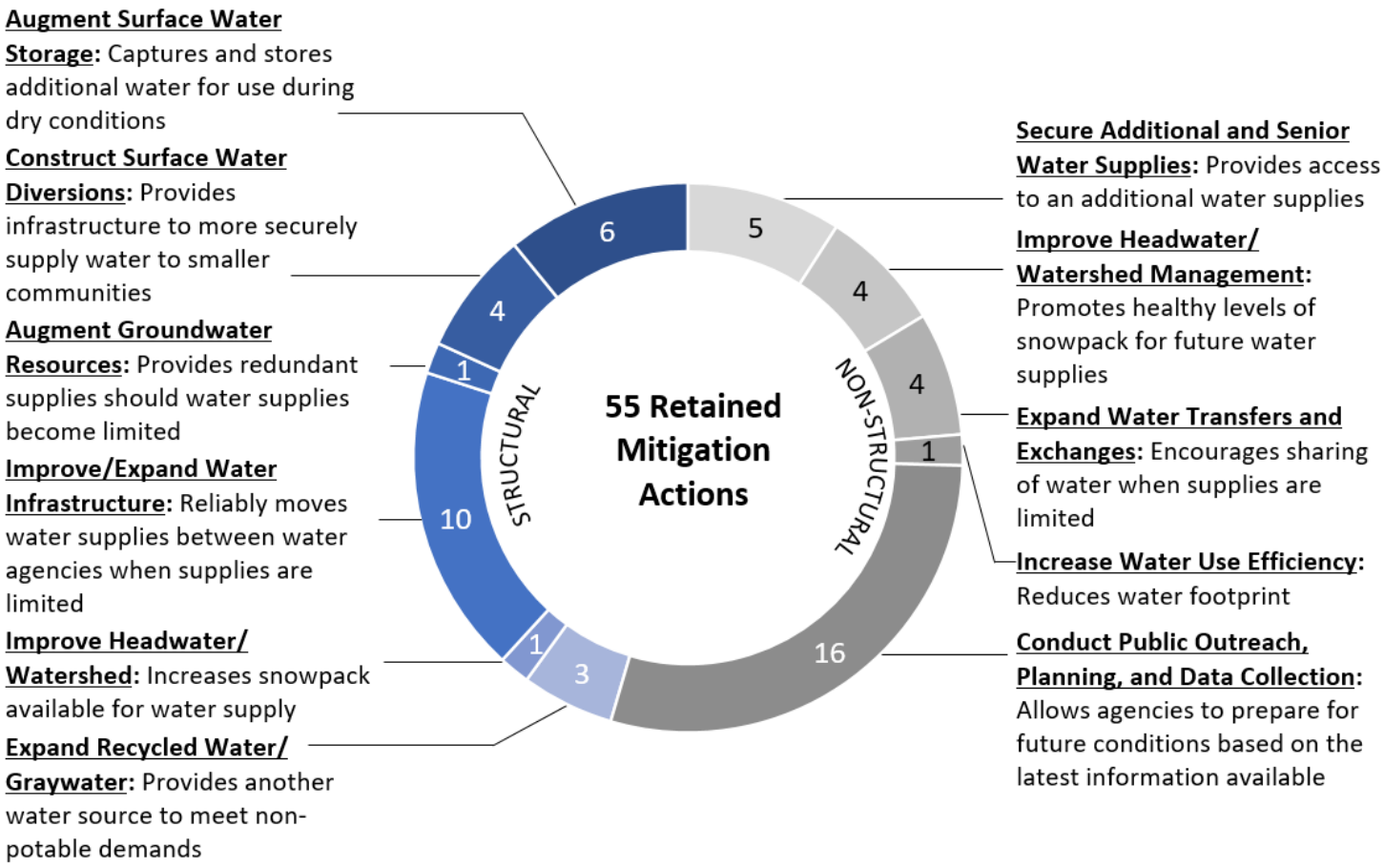


Figure 4-3. Retained Mitigation Actions by Category

Table 4-3. Retained Structural Mitigation Actions

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
S01	Develop Congressionally-authorized Alder Creek Water Storage and conservation project	Agency	County, EID, Reclamation	Augment Surface Water Storage	Developing new high mountain storage will increase water supply reliability and provide a redundant number of supplies should existing supplies become limited during, for example, dry year conditions. Upstream storage could also relieve pressure to meet low flow conditions in the American River while still having water for agriculture.	3	3	3	3	2	A
S02	Replace Echo Lake conduit and improve unlined ditch sections	EID	Agency	Augment Surface Water Storage	This will replace a 36-inch conduit to facilitate increased deliveries from Echo Lake in all water year types. Improvements to unlined ditch sections will include concrete lining that will increase water efficiency by eliminating canal scouring, seepage loss, and vegetation growth.	3	3	1	3	1	A
S03	Restore Leek Spring Meadow	American River Conservancy	Agency, CDFW, Point Blue Conservation Science, USFS	Improve Headwater/ Watershed	Restore high elevation meadow system at the headwaters of National Forest Cosumnes River to increase water storage capacity and mitigate impacts of climate change and improve habitat. Green infrastructure project. This project improves drought resiliency by increasing the water holding capacity of meadow systems, thereby enabling the natural "release" of water during the drier months of the year.	2	2	3	3	3	A

Table 4-3. Retained Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
S04	Restore high elevation meadows through fee title or conservation easement acquisition	American River Conservancy	Private Landowners	Improve Headwater/ Watershed	Permanently protect high elevation meadow systems through fee title/and or conservation easement acquisition. This action will improve drought resiliency by increasing the water holding capacity of meadow systems which act as natural reservoirs, thereby shifting the timing of runoff to later in the year during the drier summer and fall months .	3	2	3	3	3	A
S05	Construct Canyon Creek Reservoir	GDPUD	Agency	Augment Surface Water Storage	This is a storage project on Canyon Creek below the confluence with Dark Canyon Creek. Water will be conveyed through 2.6 miles of pipeline and a tunnel to a site north of Greenwood. It would provide gravity supply water to the western and southwestern portions of GDPUD's service area below 2,000 feet. Additional storage will provide water supply redundancy and improve water supply reliability.	3	3	1	2	2	A
S06	Construct an off-stream reservoir adjacent to Big Canyon Creek	GFCSD	Agency	Augment Surface Water Storage	This will construct an off-stream site adjacent to Big Canyon Creek that could draw on the same source as the existing reservoir. Additional storage will provide water supply redundancy and improve the ability to meet suppression needs and potable water demand particularly during dry year conditions.	3	3	1	1	2	A

Table 4-3. Retained Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
S07	Expand or construct treated and raw water infrastructure to provide small water systems and disadvantaged communities with reliable access to supplies.	EID, GDPUD, GFCSD	Agency	Improve/ Expand Water Infrastructure	This would expand infrastructure to increase delivery of supplies to Other County Areas (i.e., areas currently not served by a public water agency). It would locate system interties where small water systems and disadvantaged communities can more easily hook into a larger system's supply, thereby improving water supply reliability.	3	3	3	3	0	A
S08	Improve ditches and deteriorating pipelines to reduce conveyance losses	EID, GDPUD	N/A	Improve/ Expand Water Infrastructure	This will prioritize areas that are known to have a high degree of conveyance losses. Reducing conveyance losses will maximize water savings, improve water supply reliability, and increase water efficiency.	3	3	1	2	2	A
S09	Construct intertie between EID and GDPUD	EID, GDPUD	Agency	Improve/ Expand Water Infrastructure	This will install a gravity flow intertie using Highway 49 as a conduit, strengthening the mutual aid program between public water agencies, and increasing regional collaboration. This has been previously examined by EID. Another intertie location could be between Swansboro (near Mosquito) and GDPUD area via USFS roads/public lands. The intertie could be a raw water route for future GDPUD water rights from SMUD facilities under the Agency's 1927 water rights process and drought water supply storage rights in Union Valley Reservoir. An intertie between EID and GDPUD would improve water supply reliability during drought conditions.	3	3	2	3	0	A

Table 4-3. Retained Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
S10	Construct Sly Park intertie to enable water supply flexibility between Jenkinson Lake and South Fork American River	EID	Agency	Improve/ Expand Water Infrastructure	The intertie between the two major water sources will provide water supply redundancy and allow flexibility in delivering supplies during drought and emergency conditions.	3	3	2	3	0	A
S11	Construct additional diversion points at White Rock and Kyburz and an alternative point of diversion at Slab Creek	EID	SMUD, State Water Board	Construct Surface Water Diversions	This will provide an additional diversion point for raw water from the 17,000 AF of water EID annually has the right to. Currently, EID can only take that water from Folsom Reservoir. This increases system reliability and provides additional water supply redundancy during drought years. Both diversions are part of the same project, which will also benefit hydropower generation at the El Dorado Powerhouse. Kyburz has an existing diversion point, additional points of diversion can be used to move water to Kyburz. There will be an alternative point of diversion at Slab Creek.	3	3	1	3	0	B

Table 4-3. Retained Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	Mitigation Action	Lead Agency	Potential Partner Agency(ies)	Mitigation Action Category	Anticipated Drought Resiliency Benefits	Drought Resiliency	Long-Term Durability	Regional Efficiency	Water Equity	Watershed Health, Ecosystem Functions Improvements	Grouping
S12	Enlarge Stumpy Meadows Reservoir to increase storage capacity	GDPUD	Agency	Augment Surface Water Storage	This will consist of increasing storage capacity at Stumpy Meadows Reservoir. An increase in storage capacity will allow for more supplies and improve water supply reliability, particularly during dry year conditions.	2	3	2	2	2	B
S13	Construct New Rockfill Dam upstream of Stumpy Meadows Reservoir to increase storage capacity	GDPUD	Agency	Augment Surface Water Storage	This will consist of building a new rockfill dam upstream of Stumpy Meadows Reservoir. It will be operated in conjunction with the existing Stumpy Meadows Reservoir. An increase in storage capacity will allow for more supplies and improve water supply reliability, particularly during dry year conditions.	2	3	1	2	2	B
S14	Consolidate and connect small water systems	County Environmental Management Department	Agency, El Dorado Local Agency Formation Commission	Improve/ Expand Water Infrastructure	Consolidating and connecting small water systems in the OCA to a larger water purveyor will provide these small water systems with a more reliable water supply, since purveyors generally do not have major supply disruptions during drought conditions. Currently most consolidation occurs outside the planning area (Tahoe area). This is a long-term issue, with limited consolidation potential in near-term.	3	2	3	1	0	B

Table 4-3. Retained Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
S15	Construct interties between major water supplies and smaller water suppliers	EID, GDPUD, GFCSD	Agency, County Environmental Management Department, small water suppliers	Improve/ Expand Water Infrastructure	This will construct interties between water storage reservoirs and facilities throughout the water supply systems.	3	2	2	3	0	B
S16	Construct a seasonal recycled water storage reservoir	EID	Agency, City of Folsom, Sacramento Regional County Sanitation District	Expand Recycled Water/ Graywater	Construction of a seasonal recycled water storage reservoir will provide additional sources of supply and water supply redundancy.	3	2	1	3	1	B
S17	Install new wells for system redundancy	GFCSD	N/A	Augment Groundwater Resources	GFCSD currently has no operational wells. This will install new wells to provide an additional source of supply which will improve water supply redundancy and reliability.	3	3	2	1	0	B

Table 4-3. Retained Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	Mitigation Action	Lead Agency	Potential Partner Agency(ies)	Mitigation Action Category	Anticipated Drought Resiliency Benefits	Drought Resiliency	Long-Term Durability	Regional Efficiency	Water Equity	Watershed Health, Ecosystem Functions Improvements	Grouping
S18	Construct Rubicon River Diversion Conveyance System from South Fork Rubicon to Pilot Creek upstream of Stumpy Meadows Reservoir	GDPUD	Agency	Construct Surface Water Diversions	This will construct a gravity diversion conveyance system from the South Fork of the Rubicon to Pilot Creek upstream of Stumpy Meadows Reservoir. It will require Agency to negotiate with SMUD under the reopener provision of the El Dorado-SMUD Cooperation Agreement and would likely require payment to SMUD. This will provide water supply redundancy and improve water supply reliability, particularly during dry year conditions.	3	2	1	2	0	C
S19	Construct Mutton Canyon Diversion upstream from confluence with Pilot Creek	GDPUD	Agency	Construct Surface Water Diversions	Locating a new point of diversion on Mutton Canyon at a location just upstream from the confluence with Pilot Creek will provide an advantage for the existing pre-1914 Mutton Canyon water right. Water will be conveyed to either the existing Pilot Creek Diversion Dam or conveyed directly into the El Dorado Conduit. This will be used to supplement Stumpy Meadows storage by reducing the need to make releases from storage when diversions from Mutton Canyon are available, thereby maximizing water storage potential and providing operational flexibility.	1	2	1	2	0	C

Table 4-3. Retained Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
S20	Reconstruct Onion Creek Diversion and conveyance to enable delivery from Onion Creek to Pilot Creek to provide water supply redundancy and improve reliability	GDPUD	Agency	Construct Surface Water Diversions	This diversion was previously used by the District until it was destroyed by logging. Reconstructing the Onion Creek Diversion and conveyance system will allow water to be conveyed from Onion Creek to Pilot Creek, thereby providing water supply redundancy and improving water supply reliability. It will also augment district storage in Stumpy Meadows Reservoir.	1	2	2	2	0	C
S21	Improve aging infrastructure	EID, GDPUD, GFCSD	N/A	Improve/ Expand Water Infrastructure	Many of the current infrastructure was built in the gold rush era and is both inefficient and subject to failure (e.g., due to erosion). Improving aging infrastructure will minimize water losses, and ultimately increasing water supply reliability and water efficiency.	1	2	1	3	0	C
S22	Construct two pumps at North Fork American River Pumping Plant	GDPUD	Agency, PCWA	Improve/ Expand Water Infrastructure	This joint project with PCWA is located on the North Fork American River near the undeveloped Auburn Dam site. PCWA has completed a portion of the project and is now able to divert water at this location. Two pumps would be constructed on the north riverbank to serve the District to provide redundancy and improve supply reliability.	3	2	1	2	0	C

Table 4-3. Retained Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
S23	Implement erosion control and restore native vegetation to improve access to sacred grounds along specified portions of rivers/streams	Shingle Springs Band of Miwok Indians	N/A	Improve Headwater/ Watershed	This will first perform an assessment to identify erosion areas. Then it will implement erosion control via soil bioengineering (i.e., the use of [native] vegetation for erosion control, slope stabilization, and slope protection) to improve accessibility to areas impacted by drought-induced erosion.	1	2	2	3	3	C
S24	Install public water agency infrastructure upgrades	EID, GDPUD, GFCSD	N/A	Improve/ Expand Water Infrastructure	This will include performing infrastructure upgrades that focus on reducing system losses and improving urban water use efficiency under all water year types. It could include managing pressure, conducting leak detection, repairing/replacing pipelines, replacing aging meters, etc.	1	2	1	3	1	C

Table 4-34. Retained Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	Mitigation Action	Lead Agency	Potential Partner Agency(ies)	Mitigation Action Category	Anticipated Drought Resiliency Benefits	Drought Resiliency	Long-Term Durability	Regional Efficiency	Water Equity	Watershed Health, Ecosystem Functions Improvements	Grouping
S25	Install rural agricultural and agricultural infrastructure upgrades	County, EID, GDPUD, GFCSD	Agency, Local Growers	Improve/ Expand Water Infrastructure	This will include performing infrastructure upgrades to improve on-farm irrigation efficiency and irrigation methods (e.g., deficit irrigation, information management system) and provide changes for less water intensive crop types with similar or greater economic returns.	1	3	2	0	1	C

Key:
AF = acre-feet; Agency = El Dorado Water Agency; CDFW = California Department of Fish and Wildlife; County = County of El Dorado; EID = El Dorado Irrigation District; GDPUD = Georgetown Divide Public Utility District; GFCSD = Grizzly Flats Community Services District; N/A = Not Applicable; OCA = Other County Area; PCWA= Placer County Water Agency; Reclamation = U.S. Department of the Interior, Bureau of Reclamation; SMUD = Sacramento Municipal Utility District; State Water Board = State Water Resources Control Board; USFS = U.S. Forest Service

Table 4-4. Retained Non-Structural Mitigation Actions

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
I01	Collaborate amongst various agencies to improve managing forests sustainably to increase and/or better retain water supply	CABY, Tahoe Sierra IRWMs implementing agencies, USFS	Agency, EID, El Dorado & Georgetown Divide Resource Conservation Districts, SOFAR	Improve Headwater/ Watershed Management	Manage forests for water supply infrastructure protection, public safety, and economic loss – Appropriate management should increase and/or better retain water supply. A primary objective will be to collaborate with resource management agencies, power utilities, public water agencies, and stakeholders in West Slope of El Dorado County.	3	3	3	3	2	A
I02	Manage and leverage SMUD storage agreement	Agency -El Dorado Designated Representative	County, EID, GDPUD, GFCSD, SMUD	Secure Additional and Senior Water Supplies	Implement El Dorado-SMUD Agreement for additional water rights and storage – A primary objective will be to collaborate with public water agencies, lead the development of the plan and actions for full utilization. The storage allowance includes up to 15,000 AF of carryover storage without impacting SMUD operation for increased water supply reliability.	3	3	3	3	2	A
I03	Secure 40,000 AF of water rights to enable the use of the available 40,000 AF of storage in the facilities of SMUD	Agency - El Dorado Designated Representative	County, EID, GDPUD, GFCSD, SMUD	Secure Additional and Senior Water Supplies	Implement El Dorado-SMUD Agreement for additional water rights and storage – The storage allowance includes up to 15,000 AF of carryover storage without impacting SMUD operation for increased water supply reliability.	3	3	3	3	0	A

Table 4-4. Retained Non-Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
I04	Submit Change Petition for Water Right Permit 21112 for additional points of diversion and rediversion	EID	Agency, SMUD	Expand Water Transfers and Exchanges	Under P21112, 17,000 AF of water—protected by water rights—is currently diverted to Folsom Reservoir. A change petition will provide additional points of diversion at Kyburz diversion dam and White Rock penstock/Slab Creek Reservoir and rediversion to storage at Jenkinson Lake. This increases system reliability, maximizes water rights, and provides additional flexibility during drought years.	3	3	2	3	0	A
I05	Reduce and manage fuel loads	USFS	Agency, El Dorado & Georgetown Divide Resource Conservation Districts, NGOs	Improve Headwater/ Watershed Management	Ecological forest thinning, biomass removal, and prescribed fires will help improve the health and resilience the watershed, increase downstream water supply, and protect water quality.	2	2	3	3	3	A
I06	Form Upper American River Watershed Program to improve watershed health and protect regional water supplies	Agency	County, GFCSD, NGOs, public water agencies, SOFAR, USFS	Conduct Public Outreach, Planning, and Information/Data	This will include forming a watershed group of key stakeholders to identify conditions, discuss issues, and develop a plan to address key issues.	1	3	3	3	3	A

Table 4-4. Retained Non-Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
I07	Participate in downstream groundwater banking through the Sacramento Regional Water Bank	Agency, EID	GDPUD, Lower American River Public Water Agencies, Reclamation	Expand Water Transfers and Exchanges	This will rely on out-of-area banking of wet year surplus water in an aquifer in Sacramento County. During a dry year shortage, EID will exchange that water with a downstream user for a supply that EID could divert at Folsom Reservoir. This will maximize the use of supplies and improve access to water supplies during droughts.	3	3	1	3	1	A
I08	Perform public outreach and education via developing a GIS portal	Agency, County	Public Water Agencies	Conduct Public Outreach, Planning, and Information/ Data	A GIS portal will provide water supply conditions and other relevant information to inform the public of potential drought conditions and actions, ultimately improving the resources available for drought planning and preparedness.	2	3	3	3	1	A
I09	Complete water supply, infrastructure, and drought planning for OCA	Agency, County	El Dorado & Georgetown Divide Resource Conservation Districts	Conduct Public Outreach, Planning, and Information/Data	For the OCA, complete water supply, infrastructure, and drought planning may include the identification of public water agencies to provide water supplies. This planning will improve water supply reliability and provide redundancy. Developing a work plan and actions for the determination in collaboration with County, and coordinating with El Dorado County, LAFCO for approval process (if water supplies will be provided to the OCA).	3	3	3	3	0	A

Table 4-4. Retained Non-Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
I10	Consistent with Senate Bill (SB) 552 (Hertzberg), develop a water shortage contingency plan for the City of Placerville as originally recommended in the California Department of Water Resources and County Drought Advisory Group (CDAG) Report	Agency	City of Placerville, EID	Conduct Public Outreach, Planning, and Information/Data	The CDAG Report recommends a water shortage contingency plan for water systems that have 1000 to 2999 service connections to improve drought planning and preparedness. The water shortage contingency plan developed for the City of Placerville will be made available as a template for the use of small water systems in the OCA to develop their own water shortage contingency plan.	3	3	1	1	0	A
I11	Support planning/restoration of headwater meadows	Agency, American River Conservancy, Facility/ property owners (e.g., purveyors, SMUD)	CABY, Tahoe Sierra IRWMs implementing agencies, SOFAR, USFS	Improve Headwater/ Watershed Management	This will improve drought resiliency by increasing the water holding capacity of meadow systems. This will also diversify storage opportunities to add system flexibility.	1	3	3	3	2	B
I12	Provide grant-application and technical assistance to support state and federal grant applications related to drought resiliency	Agency	EID, GFCSD, GDPUD	Conduct Public Outreach, Planning, and Information/Data	Conducting an investigation in collaboration with purveyors and small water system owners will help address the intent of Assembly Bill 685 (2012) related to the human right to water.	3	2	1	3	0	B

Table 4-4. Retained Non-Structural Mitigation Actions, Continued

No.	Mitigation Action	Lead Agency	Potential Partner Agency(ies)	Mitigation Action Category	Anticipated Drought Resiliency Benefits	Criteria Scoring					
						Drought Resiliency	Long-Term Durability	Regional Efficiency	Water Equity	Watershed Health, Ecosystem Functions Improvements	Grouping
I13	Support planning efforts for local and regional adaptation plans resulting from the American River Basin Study	Agency	Folsom, PCWA, Reclamation, Roseville, RWA, Sacramento, SAFCA, SSWD	Conduct Public Outreach, Planning, and Information/Data	Reclamation's American River Basin Study identifies several regional adaptation plans to improve water supply reliability and drought preparedness. This will support further planning efforts associated with these regional adaptation plans.	1	3	3	2	2	B
I14	Develop additional agreements with public water agencies in El Dorado County for use of water rights/contract entitlements	Agency	EID, GDPUD, GFCSD	Secure Additional and Senior Water Supplies	This action will develop operational agreements as needed for flexible use of water supply entitlements, not for benefit of downstream partners (e.g., the future water right petition and CVP contract).	2	3	2	2	0	B
I15	Update County Hazard Mitigation Plan for consistency with the UARB RDCP and FEMA-funding eligibility	Agency, County	N/A	Conduct Public Outreach, Planning, and Information/Data	This will promote better collaboration and consistency between the various planning documents throughout the West Slope and allow for future funding opportunities to improve drought planning and preparedness.	3	2	3	3	0	B

Table 4-4. Retained Non-Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
I16	Support working agricultural lands, promote responsible management of public lands, and work with community groups and other listed partners	Agency	Community groups, County, El Dorado & Georgetown Divide Resource Conservation Districts, State/federal, NGOs, other agencies	Improve Headwater/ Watershed Management	This will improve water supply and water quality by raising drought awareness and best practices for water conservation. This action has a large public outreach component to it and could include facilitation of stakeholder/public outreach too.	2	2	3	3	1	B

Table 4-4. Retained Non-Structural Mitigation Actions, Continued

No.	Mitigation Action	Lead Agency	Potential Partner Agency(ies)	Mitigation Action Category	Anticipated Drought Resiliency Benefits	Criteria Scoring					
						Drought Resiliency	Long-Term Durability	Regional Efficiency	Water Equity	Watershed Health, Ecosystem Functions Improvements	Grouping
I17	Identify and cross-train individuals/agencies/ project personnel/contractors on erosion control practices to protect cultural resources as erosion worsens during drought conditions	Shingle Springs Band of Miwok Indians	County of El Dorado Tahoe Planning and Stormwater Programs Division	Conduct Public Outreach, Planning, and Information/Data	Since erosion is worsened during drought conditions, this action will educate individuals/ agencies/ project personnel /contractors on erosion control practices to prevent exposing cultural resources, damaging cultural resources, impacting plants of cultural significance, impacting archaeological resources (village sites, burial) and natural resources (plants, rocks, etc.). Training can be provided during the MS4 NPDES Permit training done by the County Tahoe Planning and Stormwater Programs Division.	0	3	2	3	3	B
I18	Modify contracts service area or expand water right's place of use (POU) to facilitate sharing of supplies	Agency, EID, GDPUD, GFCSD	Lower American water agencies, PCWA	Expand Water Transfers and Exchanges	This will help facilitate sharing of supplies. The improved flexibility of sharing supplies will help some agencies access alternative supplies should their primary water source become unavailable. This action facilitates supply sharing and has potential benefits for Folsom diverters and lower American River agencies.	2	2	3	3	0	C

Table 4-4. Retained Non-Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
I19	Participate in exchanges and water transfers	Agency, EID, GDPUD, GFCSD	Lower American water agencies, PCWA	Expand Water Transfers and Exchanges	Implementing exchanges among two or more parties (e.g., PCWA-Agency for GDPUD delivery), in general, supplies limited ability to assist most of this region but does provide additional flexibility. This action facilitates supply sharing and will improve water supply reliability, operational flexibility, and increase rate-revenue for Folsom diverters and lower American River agencies.	2	2	3	3	0	C
I20	Perform countywide service area assessment to address the needs of maintaining an adequate level of service from small public water systems in terms of water supply reliability and water quality	Agency, County Environmental Management Department	N/A	Conduct Public Outreach, Planning, and Information/Data	This action requires an assessment to address the needs of maintaining an adequate level of service from small public water systems in OCA and will improve water supply reliability and water quality.	1	3	1	3	0	C

Table 4-4. Retained Non-Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
I21	Gather information/ data on demand, supply, and infrastructure for OCA	Agency, County	N/A	Conduct Public Outreach, Planning, and Information/Data	For the OCA, gathering information/data on demand, supply, and infrastructure will provide the Agency/County the ability to drought planning, preparedness, and resiliency. Additional information is needed to determine what their current situation is (water quality and quantity issues) and data to inform emergency response (when there is a drought where do you put water stations, etc.). This could also include performing a private well inventory. This will include expanding checking wells and expanding data collection through CIMIS.	1	3	3	3	0	C
I22	Develop temporary agreements with downstream regional public water agencies for temporary use of water rights/contract entitlements	Agency	TBD	Secure Additional and Senior Water Supplies	As needed operational agreements for the flexible use of water supply contracts will be held with downstream regional partners and would be exercised temporarily. This will improve operational flexibility and maximize the use of water supplies.	1	2	3	1	0	C

Table 4-4. Retained Non-Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
I23	Support snowpack and other watershed water supply conditions data collection and dissemination	Agency	SOFAR, UC Merced, UC Agriculture and Natural Resources	Conduct Public Outreach, Planning, and Information/Data	The recent funding received from Reclamation for the American River Hydrologic Observatory network will provide accurate data for day-to-day decision making related to water allocations, reservoir operations, hydropower generation, and environmental flow determinations. It is expected to increase forecast reliability and availability of up to 18, 000 acre-feet per year. This effort will help assess the rate and extent of declining snowpack water storage in the Sierra Nevada.	1	3	3	3	0	C
I24	Implement Water Conservation Education Programs	American River Conservancy	Agency, EID, El Dorado Office of Education	Conduct Public Outreach, Planning, and Information/Data	This effort will educate the public about water conservation and encourage daily habits that decrease water use, especially during the summer. This effort will decrease a demand for water.	2	1	3	3	1	C
I25	Investigate and improve understanding of potential levels of concerns over water accessibility and affordability	Agency	Federal, local, and regional partners	Conduct Public Outreach, Planning, and Information/Data	This will include collaboration with local, federal, and regional partners to gain a more comprehensive and complete outlook on water accessibility and affordability in the planning area.	1	1	1	3	0	C

Table 4-4. Retained Non-Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	**Mitigation Action**	**Lead Agency**	**Potential Partner Agency(ies)**	**Mitigation Action Category**	**Anticipated Drought Resiliency Benefits**	**Drought Resiliency**	**Long-Term Durability**	**Regional Efficiency**	**Water Equity**	**Watershed Health, Ecosystem Functions Improvements**	**Grouping**
I26	Develop or enhance ordinance to further promote drought protection and water conservation	Agency, County, EID, GDPUD, GFCSD	CABY IRWM, RWA, Tahoe Valley South Subbasin Groundwater Sustainability Agency	Conduct Public Outreach, Planning, and Information/Data	This will promote drought protection and water conservation. Established partnership roles and responsibilities can be found in the CABY IRWM; RWA; Tahoe Valley South Subbasin Groundwater Sustainability Agency; El Dorado-SMUD Agreement.	0	3	1	0	0	C
I27	Engage in federal and state advocacy	Agency	N/A	Conduct Public Outreach, Planning, and Information/Data	The intent of this action is to positively influence legislative and regulatory actions to protect, preserve, and improve El Dorado County's water supply reliability. This is part of the Agency's commitment for collaboration in pursuit of the County's goals as acknowledged by the Agency Strategic Plan. This will highlight the unique drought vulnerability and mitigation action needs for this region for additional financial and technical assistance.	1	2	3	3	1	C

Table 4-4. Retained Non-Structural Mitigation Actions, Continued

						Criteria Scoring					
No.	Mitigation Action	Lead Agency	Potential Partner Agency(ies)	Mitigation Action Category	Anticipated Drought Resiliency Benefits	Drought Resiliency	Long-Term Durability	Regional Efficiency	Water Equity	Watershed Health, Ecosystem Functions Improvements	Grouping
I28	Facilitate countywide collaboration for sustainable water management. Continue revision and implementation of WRDMP and similar plans	Agency	N/A	Conduct Public Outreach, Planning, and Information/Data	This will leverage collaboration among existing regional planning groups to improve drought planning and preparedness. For example, the Agency has initiated the Countywide Plenary for Water which includes a diverse range of stakeholders and could serve to help inform on and address drought-related issues.	0	2	3	3	1	C
I29	Explore potential of graywater reuse and rainfall harvesting at household and individual facility levels	All Public Water Agencies, Individuals	Agency	Increase Water Use Efficiency	Graywater could provide an additional source of water supply but will need to be explored in detail before its potential benefit could be realized. Graywater is assumed to provide additional water supplies to improve water supply reliability.	2	1	1	1	1	C
I30	Continue cloud seeding	SMUD	N/A	Secure Additional and Senior Water Supplies	This will aim to modify the weather to generate precipitation and therefore increase water supply within the planning area.	1	1	2	0	1	C

Key: AF = acre-feet; Agency = El Dorado Water Agency; CABY = Cosumnes, American, Bear, Yuba; CIMIS = California Irrigation Management Information System; County = County of El Dorado; CVP = Central Valley Project; EID = El Dorado Irrigation District; FEMA = Federal Emergency Management Agency; GDPUD = Georgetown Divide Public Utility District; GFCSD = Grizzly Flats Community Services District; GIS = Geographic Information System, IRWM = Integrated Regional Water Management; LAFCO = Local Agency Formation Commission, MS4 = Municipal Separate Storm Sewer System, NPDES = National Pollutant Discharge Elimination System; NGO = Non-governmental Organization; N/A = Not Applicable; OCA = Other County Area; PCWA= Placer County Water Agency; Reclamation = U.S. Department of the Interior, Bureau of Reclamation; RDCP = Regional Drought Contingency Plan; RWA = Regional Water Authority; SAFCA = Sacramento Area Flood Control Agency; SMUD = Sacramento Municipal Utility District; SOFAR = South Fork American River Cohesive Strategy; SSWD = Sacramento Suburban Water District, TBD = to be determined; UARB = Upper American River Basin; UC = University of California; USFS = U.S. Forest Service; WRDMP = Water Resources Development and Management Plan

Figures 4-4 and **4-5** show the number of mitigation actions in each grouping by category for structural and non-structural mitigation actions, respectively. Structural mitigation actions related to augmenting surface water storage, improving/expanding water infrastructure, and improving headwater/watershed conditions have the potential to improve drought resiliency in this region (i.e., Group A). For the non-structural mitigation actions, almost all categories have at least one action in Group A. The largest volume of mitigation actions retained are those related to performing public outreach, conducting planning, and gathering information and data.

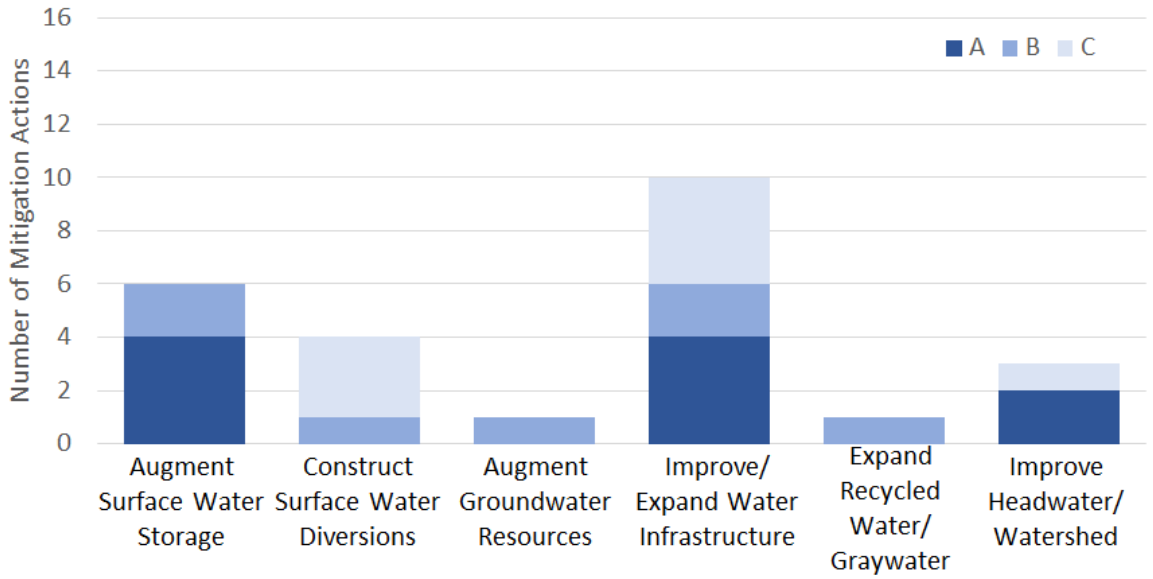


Figure 4-4. Prioritization Results for Structural Mitigation Actions by Category

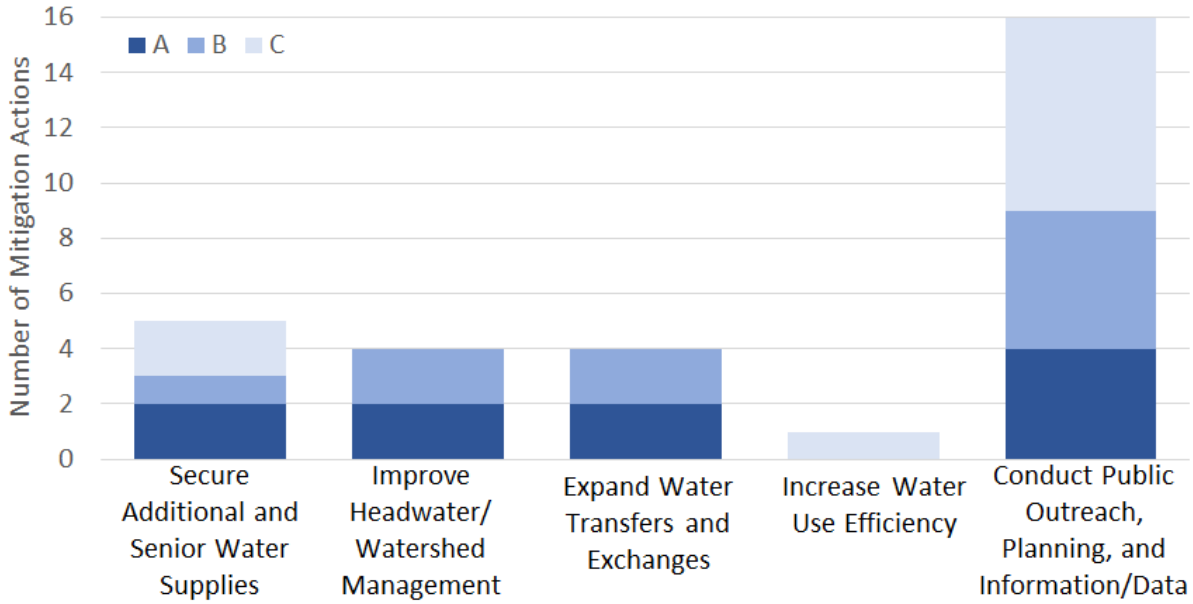


Figure 4-5. Prioritization Results for Non-Structural Mitigation Actions by Category

4.3.2 Other County Area Mitigation Actions Summary

As noted in **Section 3**, the most vulnerable areas in the region are the OCA as they rely primarily on one water source (typically individual wells in fracture rock formations), have less redundancy than public water agencies, do not have access to other alternative water supplies during dry conditions, and do not have drought contingency plans. Even if individual residents and the small water systems are in close proximity to larger public water agencies, they are often isolated and not able to be economically or feasibly connect to these larger systems due to the foothill's challenging terrain. Additionally, the OCA historically has more difficulty in funding infrastructure maintenance and replacement due to poor economies of scale and lack of staff.

Because of the OCA's higher vulnerability, this section is included to highlight the mitigation actions that improve the OCA's drought resiliency. In the UARB RDCP effort, the Agency represents the interests of the OCA by improving access to and reliability of water supplies when water supplies are limited during drought conditions. **Figure 4-6** briefly describes how the OCA's drought-related vulnerabilities can be addressed using the mitigation actions identified above.

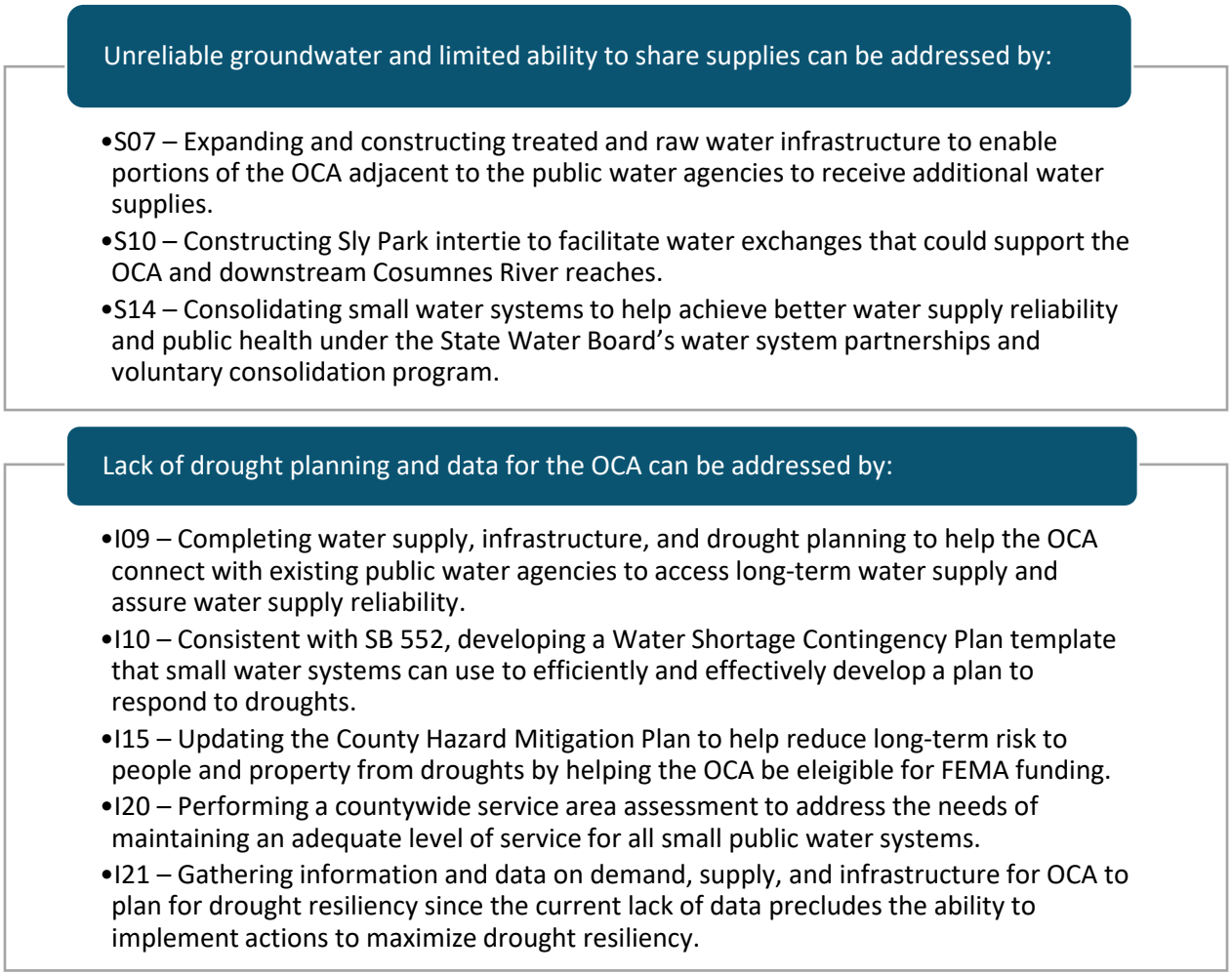


Figure 4-6. Mitigation Actions that Can Address the Vulnerability Pathways Affecting the Other County Area

4.4 Addressing Future Threats

The mitigation actions developed for the UARB RDCP are focused on addressing the identified drought-specific vulnerabilities identified in **Section 3**. Future climate change and population growth consistent with the County General Plan are among the factors that are likely to exacerbate these vulnerabilities. Moreover, ongoing State-led initiatives are likely to substantially alter statewide water system operations, including those affecting Folsom Reservoir and the public water agencies. The Agency and public water agencies in the planning areas will focus future efforts in supporting the implementation of SB 606 (Hertzberg) and AB 1668 (Friedman), which are geared towards establishing a new foundation for long-term improvements in water conservation and drought planning to adapt to climate change and the resulting longer and more intense droughts in California. Below are ongoing and anticipated efforts that will help address future threats in the planning area.

The Alder Creek Water Storage and Conservation Project (mitigation action S01) is identified as an important strategy to address long-term regional water supply reliability. The proposed 175,000 AF storage project will create storage off-stream from the upper South Fork of the American River and include a series of tunnels, water conveyance conduits, and hydroelectric power houses.

Alder Reservoir is anticipated to increase storage in the Upper American River Watershed by 10 percent and increase the total watershed storage up to 2 million AF. Implementation of Alder Reservoir will provide water supply for long-term economic viability for rural counties, support water supply vulnerabilities to local areas and to diverters at Folsom Reservoir and address declining snowpack in the upper elevation of the Sierra Nevada and the American River Basin.

The ARBS (Reclamation et al. 2022) examined strategies to integrate or better coordinate local and federal water management practices. It reviewed and incorporated new scientific information on climate change specific to the American River Basin that can better inform future operational decisions. In addition, the ARBS assessed significant recent changes in conditions and regulatory requirements related to the CVP and regional water management; including but not limited to, Biological Opinions for endangered fishery species protection and protection of the Delta, and water rights administration under drought conditions. Specifically, the ARBS provided basin-specific, integrated water management strategies to improve regional water supply reliability within the American River Basin, while improving Reclamation’s flexibility in operating Folsom Reservoir to meet flow and water quality standards and protect endangered fishery species in the lower American River.

Data collection, management, and sharing will continue to inform planning efforts to address future threats (mitigation actions I08, I16, I19, I21, I22, and I25). Data collection efforts already exist within the planning area, but the collection of additional data is necessary to have a better understanding of the vulnerabilities the planning area is facing. Existing data collection efforts will be leveraged, expanded, and used as models for new data collection efforts. For example, the American River Conservancy has the Cosumnes River Water Quality Monitoring program which monitors 21 different sites for different water quality parameters such as pH and dissolved oxygen. The collection of this data is done by science volunteers that submit the collected data to the California Environmental Data Exchange Network (CEDEN) as part of a Surface Water Ambient Water Monitoring program. CEDEN is a central location to store and share information about California's waterbodies, including streams, lakes, rivers, and coastal ocean waters.

The County EMD provided recommendations to DWR's CDAG draft recommendations and guidance for small water suppliers and rural communities. The guidance provided in DWR's CDAG Report formed the basis of SB 552—which imposes new drought planning requirements for small water suppliers, such as those in the West Slope. The requirements of this legislation were integrated in the UARB RDCP (i.e., mitigation action I10).

5. Response Actions

While mitigation actions can reduce many of the planning area's vulnerabilities, it is important to identify response actions which can help expeditiously mitigate impacts during the early stages of drought and during ongoing drought conditions in the planning area. Individual agencies, such as public water agencies, already have separate response actions as identified in their drought plans. For the OCA, no drought plans exist. The regional response actions developed for the UARB RDCP are meant to collectively reduce the impacts of drought conditions and not supersede those already developed by others, including public water agencies.

This section describes any requirements or guidelines related to response actions, summarizes existing individual water agency response actions, and presents the regional response actions developed through the UARB RDCP process.

5.1 State Requirements and Guidelines

The following text describes the various drought response actions required or recommended by the State based on the number of customers served by each entity.

5.1.1 Urban Water Suppliers

DWR requires that urban water suppliers[7] prepare and submit an UWMP to support long-term resource planning and ensure adequate water supplies are available to meet existing and future water demands. One component of a UWMP is the WSCP, the product of a strategic planning process to prepare for and respond to drought or catastrophic water supply shortages. Shortages can result from a variety of events such as drought, fire, water quality contamination, and system infrastructure failure. The purpose of a WSCP is to maintain reliable supplies and reduce the impacts of supply interruptions. As drought has been the most common of these shortage concerns, WSCP's serve as an effective framework for individual public water agency drought response actions.

While UWMPs are required to be updated every five years, WSCPs are a living document that can be updated at any time to respond to current conditions and refined over time to accurately reflect a public water agency's supply diversity and availability, local preferences for reducing use, and compliance with state and local laws such as water waste prohibitions. However, the most current version of the WSCP must be included in each cyclical UWMP submission.

There are twelve required components of a WSCP. The four components most relevant to response actions of the UARB RDCP are described below.

Six Standard Water Shortage Stages – Urban water suppliers are required to design a WSCP to account for six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers define these

[7] Urban water suppliers are those who provide over 3,000 AF of potable water annually or serve more than 3,000 end users.

shortage levels based on the urban water suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.

Shortage Response Actions – Urban water suppliers must develop shortage response actions that align with the defined shortage levels and include, at a minimum, the following:

- Locally appropriate supply augmentation actions
- Locally appropriate demand reduction actions to adequately respond to shortages
- Locally appropriate operational changes
- Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions
- For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action

Communication Protocols – Urban water suppliers must identify communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all the following:

- Any current or predicted shortages as determined by the annual water supply and demand assessment
- Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment
- Any other relevant communications

Compliance and Enforcement – If the urban water supplier is a retail water supplier, it should describe how it will ensure compliance with and enforce provisions of the WSCP. The urban water supplier describes the means it uses to ensure compliance and enforcement, including but not limited to:

- Customer service, education, and communication programs
- Water-waste patrols
- Warning and citation protocols
- Fines and surcharges
- Policies and procedures related to treatment of irrigation malfunctions
- Other urban water supplier responses

5.1.2 Small Water Systems and Rural Communities

As part of the 2018 California Water Conservation legislation, California Water Code Section 10609.42 directs DWR to propose recommendations and information in support of improving small water systems' and rural communities' drought preparedness. Due to the diverse conditions for small water

systems and rural communities throughout the state, DWR's recommendations are for further considerations by the Legislature to formulate more defined requirements for drought planning for small water systems and rural communities, as well as the potential for counties serving as a responsible agency.

In response to this legislation, DWR prepared a report in collaboration with the County Drought Advisory Group (CDAG)[8] (DWR 2021). The report formed the basis for SB 552, which requires the following as it relates to response actions:

- Small water suppliers serving 1,000 to 2,999 service connections need to develop and maintain an abridged Water Shortage Contingency Plan that includes specified drought-planning elements by July 1, 2023. This includes annual reporting on specified water supply condition information to the State Water Board.
    - Small water suppliers need to implement specified drought resiliency measures, including, among others, having at least one backup source of water supply and metering each service connection.
- Small water suppliers serving fewer than 1,000 service connections need to add drought planning elements to their emergency notification or response plan and submit the plan to the State Water Board. This includes annual reporting on specified water supply condition information to the State Water Board.
- Counties need to establish a standing drought and water shortage task force to facilitate drought and water shortage preparedness for state small water systems and domestic wells within the county's jurisdiction by January 1, 2022.

The Agency participated in DWR's workgroup to provide perspectives of foothill communities and associated unique conditions. Continued engagement in future legislative processes is critical to ensure the resulting legislative requirements are applicable and implementable for foothill communities and rural counties like El Dorado County.

5.2 Existing Individual Water Agency Response Actions

The following subsections describe the response actions for the three public water agencies based on the above requirements and guidelines.

[8] CDAG is a stakeholder advisory group consisting of state agencies, cities, counties, small communities, small water suppliers and other stakeholders.

5.2.1 El Dorado Irrigation District

EID is an urban water supplier and as such has developed an UWMP with a WSCP. **Table 5-1** lists EID's drought stages, water supply conditions, and associated response actions. Various hydrologic conditions inform EID's drought stages. Historically, EID staff determine whether drought actions are triggered based on a combination of precipitation outlooks and whether Jenkinson storage levels are decreasing from January to March and approaching the 25,000 AF storage level (EID 2015, EID 2020). EID also reviews snow pillow data and conducts their own snow surveys in the upper watersheds such as Caples Lake to assess water conditions and to manage their upper reservoirs (Caples Lake, Echo Lake, Silver Lake and Lake Aloha) to meet FERC license conditions and storage targets. The EID General Manager uses this information to declare a water shortage emergency due to the existing conditions or when there is a high probability that a condition will be realized soon.

Table 5-1. El Dorado Irrigation District Drought Stages and Response Actions

Drought Stage	Water Supply Condition	Objective	Response Actions
None – ongoing water conservation and enforcement of water waste prohibition	Normal Water Supply	Public awareness of water efficiency practices and prohibition of water waste	Public outreach and education for ongoing water efficiency practices and the prohibition of water waste
Stage 1 – Introductory stage with voluntary reductions in use	Slightly Restricted Water Supplies Up to 15 percent Supply Reduction	Initiate public awareness of predicted water shortage and encourage conservation	Encourage voluntary conservation measures to achieve up to a 15 percent demand reduction
Stage 2 – Voluntary and mandatory reductions in water use	Moderately Restricted Water Supplies Up to 30 percent Supply Reduction	Increase public awareness of worsening water shortage conditions. Enforce mandatory measures such as watering restrictions	Voluntary conservation measures are continued, with the addition of some mandatory measures to achieve up to a 30 percent demand reduction
Stage 3 – Mandatory reductions in water use	Severely Restricted Water Supplies Up to 50 percent Supply Reduction	Enforce mandatory measures and/or implement water rationing to decrease demands	Enforce mandatory measures to achieve up to a 50 percent demand reduction
Stage 4 – Water rationing for health and safety purposes	Extremely Restricted Water Supplies Greater than 50 percent Supply Reduction	Enforce extensive restrictions on water use and implement water rationing to decrease demands	Enforce mandatory measures to achieve greater than 50 percent demand reduction

5.2.2 Georgetown Divide Public Utility District

GDPUD is also an urban water supplier. It has four stages of drought as summarized in **Table 5-2** along with associated drought response actions**.** Historically, the amount of Stumpy Meadows reservoir storage on April 15th has triggered the declaration of drought stages by the GDPUD Board of Directors. These range from a voluntary to mandatory reduction goals for both treated water and agricultural accounts of up to 50 percent.

Table 5-2. Georgetown Divide Public Utility District Drought Stages and Response Actions

Drought Stage	Drought Stage Trigger	Water Supply Condition	Response Actions
1	Stumpy Meadows Reservoir on Second Week of April is 17,000 AF (77 percent of normal)	15 percent Total Supply Reduction	Customers are informed of possible shortages and asked to voluntarily conserve up to 15 percent
2	Stumpy Meadows Reservoir on Second Week of April is 15,000 AF (68 percent of normal)	Up to 25 percent Total Supply Reduction	Voluntary and mandatory measures are implemented to achieve a demand reduction goal of up to 25 percent
3	Stumpy Meadows Reservoir on Second Week of April is 13,000 AF (59 percent of normal)	Up to 35 percent Total Supply Reduction	Enforcement of mandatory measures to achieve a demand reduction goal of up to 35 percent
4	Stumpy Meadows Reservoir on Second Week of April is 10,000 AF (45 percent of normal)	Up to 50 percent Total Supply Reduction	Water rationing for health and safety purposes to achieve a 50 percent reduction of demands

Key: AF = acre-feet

5.2.3 Grizzly Flats Community Services District

GFCSD is not an urban water supplier because it serves less than 3,000 end users and as such does not have a UWMP with a WSCP. Instead GFCSD developed a *2017 Water Supply and Demand Update* which includes response actions. These response actions include both those contained within their *2007 Drought Plan* and additional actions taken during the 2012-2016 drought.

GDPUD has three stages of drought and associated response actions as summarized in **Table 5-3.** The drought stages are triggered based on water stage and storage at their Water Treatment Plant Reservoir, as listed in the table below.

Table 5-3. Grizzly Flats Community Services District Drought Stages and Response Actions

Drought Stage	Drought Stage Trigger	Water Supply Condition	Objective	Response Actions
None – Ongoing conservation measures. Prohibition of Wasted Water in effect.	Not applicable	Normal: 0 percent Total Supply Reduction	Public awareness	Normal actions
Drought Stage 1 – Voluntary reductions in use	Water Treatment Plant Reservoir has 10.6 ft stage, less than 22 acre-feet at the end of June	Slightly Restricted Water Supplies (below normal): Up to 15 percent Total Supply Reduction	Initiate public awareness of predicted water shortage and encourage conservation	Encourage voluntary measures to decrease "normal" demand up to 15 percent
Drought Stage 2 – Increased voluntary restrictions on use	Water Treatment Plant Reservoir has 9.6 ft reservoir stage, less than 20 acre-feet at end of June	Moderately Restricted Water Supplies: Up to 30 percent Total Supply Reduction	Increase public understanding of worsening water supply conditions, encourage voluntary conservation measures	Encourage voluntary measures to decrease "normal" demand up to 30 percent
Drought Stage 3 – Mandatory restrictions (severe prohibitions) on use	Water Treatment Plant Reservoir has 6.75 ft reservoir storage, less than 14 acre-feet at the end of July or August	Severely Restricted Water Supplies: Up to 50 percent Total Supply Reduction	Ensure that water use is limited to health and safety purposes	Enforce extensive restrictions on water use and implement water rationing to decrease demand up to 50 percent of 300 gpd/parcel allotment

Key: ft = feet
Note: Total Water Treatment Plant Reservoir stage for Grizzly Flats Community Services District is 13.2 feet.

5.3 Regional Response Actions

In addition to the individual response actions described above, regionally coordinated response actions are important because, as stated above, the OCA makes up a large portion of the planning area and is not covered by an existing WSCP or similar drought plan. The lack of response actions was experienced by some parts of the OCA during the 2012 to 2016 drought when domestic and agricultural supply wells ran dry, and water had to be trucked in or obtained from a water station. Additionally, the regional response actions aim to provide county-wide awareness to the public to promote early action and collaboration. The regional response actions also help support the CDAG recommendations described above. The regional response actions will be led and coordinated by the Agency.

As discussed in **Section 2**, the Agency will monitor regional drought conditions through the U.S. Drought Monitor. The regional water supply indicators listed in **Table 5-4**, as defined by the U.S. Drought Monitor, will provide standard triggers/thresholds to inform the Agency of when to initiate response actions within the planning area. Implementation of these regional response actions will help ensure that the communities most susceptible, such as those in the OCA, have the resources and support necessary to minimize any drought impacts they may experience. The following is a description of each trigger and the Agency's respective regional response actions with additional details on the actions that will completed.

Table 5-4. Regional Response Actions

Drought Intensity*	Trigger	Response Action	Response Action Details
Continual	Not applicable – ongoing on regular basis	Public outreach and education for ongoing water efficiency practices and to reduce water waste	Public education and outreach to include the following: • Standing drought/water efficiency section in Agency's quarterly newsletters • Regular updates at Agency Board of Directors Meetings on water supply outlook for county • Standing indicator on Agency's in-progress GIS portal dashboard • Standing drought section on the Agency website with links to available resources (e.g., water fill stations locations, non-profit assistance programs)
D2 – Severe Drought	Enters D2 Intensity anytime between March and September	Press release identifying early onset of drought and encouraging water conservation and preparedness	Prepare and distribute special press releases using venues such as: Agency website, which will have designated drought monitoring and water outlook pages for public to view; Agency Twitter and Facebook; Mountain Democrat article; Regional Water Authority news blast; Mountain Counties Water Resources Association news blast; any other existing distribution lists (e.g., County Environmental Management Department, Growers Association)
D3 – Extreme Drought	Intensity increases in West Slope from D2 to D3 Intensity	Press release identifying severe/extreme drought and encouraging water conservation	Prepare and distribute special press releases using the same venues identified under the D2 trigger.
		Convene water agencies and land use entities monthly	With a focus on conditions for the OCA, establish/review conservation measures, referring to recommended drought policies from the *Drought Plan* (Agency 2007); discuss status of conservation measures; map out areas of concern; identify actions to mitigate drought conditions (e.g., water stations, trucking contracts, early preparedness measures), including roles, responsibilities, and schedule Initial Meeting Logistics *When:* Once, within month of trigger *Who:* Agency, EID, GDPUD, GFCSD, County Environmental Management Department, and City of Placerville Subsequent Meeting Logistics *When:* Monthly after initial meeting *Who:* Above listed agencies, plus the following agencies will be invited: Drought Planning Task Force members, California Department of Forestry, County Fire, Natural Resources Conservation Service, other customer group representatives (e.g., agriculture, urban, recreation, Chamber of Commerce)
		Obtain assistance from non-profits to assist the OCA with receiving water supplies	Provide cost sharing grant funding to purveyors for drought preparedness projects.
D4 – Exceptional Drought	Intensity increases in West Slope from D3 to D4 Intensity	Press release identifying exceptional drought and encouraging water conservation	Prepare and distribute special press releases using the same venues identified under the D2 trigger. Consider paid advertising to further raise awareness on the exceptional drought conditions.
		Continue to convene public water agencies and land use entities on a biweekly basis	With a focus on conditions for the OCA, overview updated drought conditions and any Executive Orders, curtailments, etc.; review map of areas of concern; provide update on status of actions identified under D3 trigger. Identify if any additional support is needed; discuss if new problems or issues have arisen and identify actions and roles to address them. Meeting Logistics *When:* Biweekly, starting within month of trigger *Who:* Same agencies identified under D3 trigger

Key: Agency = El Dorado Water Agency; County = County of El Dorado; EID = El Dorado Irrigation District; GDPUD = Georgetown Divide Public Utility District; GFCSD = Grizzly Flats Community Services District; GIS = Geographic Information System; OCA = Other County Area

* As defined by U.S. Drought Monitor for the West Slope of El Dorado County.

6. Operational and Administrative Framework and Update Process

This section provides the framework for operation and administration for the UARB RDCP, and the associated update process.

6.1 Purpose and Scope

The UARB RDCP and associated planning is meant to be part of an adaptive process that is routinely updated to reflect the evolving needs in the planning area. The EC and DPTF recognize the importance of continuous coordination with Reclamation in all aspects of implementing the UARB RDCP.

The purpose of this section is to describe the roles, responsibilities, and procedures for ongoing activities associated with the UARB RDCP including conducting drought monitoring; initiating and updating mitigation and response actions and communicating with the public about those actions; and evaluating and updating the UARB RDCP. Anticipated frequencies for these activities and potential funding and financing mechanisms are also discussed.

6.2 Development of Operational and Administrative Framework

The EC reviewed and provided feedback on an initial UARB RDCP Operational and Administrative Framework (Framework). Feedback from the EC was integrated to revise the Framework which was shared with the DPTF for additional feedback. Comments received from the DPTF on the Framework were addressed and shared with the EC to integrate in the public draft UARB RDCP. Comments from the public during the public review period on the Framework were addressed and were integrated to finalize the Framework in the final UARB RDCP.

6.3 Operational and Administrative Framework

The UARB RDCP is a living document intended to be implemented and updated as needed. This section discusses roles and responsibilities of the entities involved to develop and implement the UARB RDCP. In addition, this section provides an overview on the UARB RDCP update process and schedule of anticipated activities.

6.3.1 Roles

Successful implementation of the UARB RDCP depends on the clearly defined roles of the project sponsors, EC, DPTF, and stakeholders and interested parties in the UARB RDCP planning area.

Project Sponsors

The project sponsors for development of this UARB RDCP are the Agency and Reclamation. The project sponsors provide oversight of the UARB RDCP, make final decisions regarding the structure and content

of the UARB RDCP, provide guidance and direction on next steps and recommended actions (as appropriate), and engage with stakeholders and interested parties. Pertaining to implementation, the responsibility lies with the local project sponsor (Agency) for facilitating implementation of the plan. The Agency will continue to help facilitate discussions amongst the EC and DPTF and support implementation and updates, as needed, of the UARB RDCP.

Executive Committee

As mentioned in Section 1, the EC represented the entities that manage the water supplies within El Dorado County to act on behalf of, and within the powers granted to them. The EC included public water agencies and the entities who have specific management responsibilities for small water systems and rural communities that are more vulnerable to droughts. Generally, the EC was composed of officers, general managers, assistant general managers, directors, department managers, etc. who are appointed by the entity they represent to act on behalf of, and within the powers granted to them. The EC consisted of the following entities:

- El Dorado Irrigation District
- Georgetown Divide Public Utility District
- County of El Dorado, Environmental Management Department
- Grizzly Flats Community Services District
- El Dorado Water Agency on behalf of Other County Area (i.e., areas in El Dorado County that fall outside federally managed land and a public water agencies' service area)

The EC's role throughout preparation, implementation, and update of the UARB RDCP was to provide input on regional opportunities, implement mitigation and response actions when identified as lead agency, review progress, and discuss UARB RDCP related issues and needs. During the EC meetings, members provided perspectives as representatives of their diverse communities when reviewing UARB RDCP content. The EC also fostered collaboration amongst agencies to address and maintain consistency, to the extent possible, with local drought resiliency goals.

Drought Planning Task Force

A task force is a group of people, from diverse branches, positions, and points of view, that convene to facilitate the development of ideas, create new opportunities, answer questions, or solve a problem towards the development of the UARB RDCP. The DPTF was a voluntary representative "working group" that will bring together a specific set of skills and perspectives to review, edit, and provide suggestions for the EC to prepare, implement, and update the plan. The DPTF also existed to promote collaboration and shared understanding across a broad stakeholder group.

All members had sufficient on-the-ground expertise regarding water management and drought protection for specific water use areas or categories. The entities that made up the DPTF are shown in **Table 1-1**.

Stakeholders and Interested Parties

In addition to what was described in Section 1 as part of UARB RDCP preparation, the Agency, as the local project sponsor, will continue to inform stakeholders and interested parties with updates on UARB RDCP implementation. The Agency will continue to update its website and send email communications to inform interested parties of meetings, new materials, and other information related to the UARB

RDCP, its implementation, and any future updates. Participation in this group will continue to be voluntary and open to any organization or individual expressing interest.

6.3.2 Responsibilities

The anticipated responsibilities for each anticipated implementation and update activity for the EC, DPTF, stakeholders and interested parties are summarized in the "RACI" chart, **Table 6-1**. The following describes the level of responsibility each role may have:

- **R = Responsible** parties are responsible for completing the activity or task
- **A = Accountable** parties are ultimately answerable for the implementation of the activity or task
- **C = Consulted** parties are those whose opinions are sought (e.g., subject matter experts) and provide input
- **I = Informed** parties are those who are kept up to date on the progress of the overall activity after certain milestones are met

6.3.3 Plan Update Process and Schedules

Based on the anticipated activities, process, and schedule for implementing, monitoring, evaluating, and updating the UARB RDCP shown in **Table 6-1** above, **Figure 6-1** provides a visual representation of the activities. The Agency expects that UARB RDCP implementation will involve regular monitoring and evaluation efforts to assess when to initiate response actions, to track mitigation action progress, and to guide future UARB RDCP updates in concert with available information from regional ongoing efforts. Mitigation actions will also be continually implemented as funding is available. Communication and outreach will occur as needed to inform stakeholders and interested parties of any significant updates or conditions. Response actions will also be initiated as needed based on the ongoing drought monitoring. EC meetings will be held annually to discuss water supply conditions, review/update the UARB RDCP, and discuss mitigation action implementation. A plan update "needs evaluation" will be performed to determine the necessity of a comprehensive update of the UARB RDCP every five years. If the evaluation demonstrates a need to update the UARB RDCP, the plan update process shown in **Figure 6-2** will be followed, which includes close coordination with both the EC and DPTF. Initiation and completion of implementation and update activities will be contingent on the availability of sufficient funding.

Table 6-1. Anticipated UARB RDCP Implementation and Update Activities

Activity	Frequency	Executive Committee			DPTF	Stakeholders and Interested Parties
		Agency	Public Water Agencies	County		
Implement RDCP						
Drought Monitoring. On an ongoing basis, the Agency will monitor indicators and indices for trigger levels that may indicate the onset of drought conditions.	Ongoing	R, A	C	C	C, I	I
Implement Mitigation Actions. The Agency will oversee and track implementation of individual actions. **I**mplementing each individual mitigation action falls on the project proponent(s) or project lead(s), either the individual agency or group of agencies**.**	Ongoing	R, A	R, A	R, A	C, I	I
Initiate Response Actions. Initiate regional response actions based on drought monitoring.	As needed	R, A	A	A	C, I	I
Update the RDCP						
Annual Review**.** The EC will meet annually to: ○ Discuss drought monitoring and conditions. ○ Review the vulnerability assessment and identify any changes in vulnerabilities, including evolving needs in the region. ○ Determine the need for new/revised mitigation actions, update the status of existing actions, and add new actions (as needed). ○ Identify funding needs and sources for the following year's activities and develop a plan to pursue identified funds. ○ Identify coordination needs with other efforts.	Annual	R, A	A	A	C	I
RDCP Update Need Evaluation**.** Every five years, the Agency will assess the need for and prepare an updated RDCP (as necessary). If the outcome is to prepare an updated RDCP, the EC and DPTF will be convened.	Every 5 years (or as needed)	R, A	C	C	C	I

Table 6-1. Anticipated UARB RDCP Implementation and Update Activities, Continued

Activity	Frequency	Executive Committee			DPTF	Stakeholders and Interested Parties
		Agency	Public Water Agencies	County		
Communication and Outreach						
RDCP. Inform stakeholders of RDCP implementation and updates via website updates and email communications.	As needed	R, A	I	I	I	I
Mitigation Actions and Response Actions. Each individual agency will be responsible for apprising its ratepayers and the public of any actions initiated and related progress/results.	As needed	R, A	R, A	R, A	R, A	I

RACI Terminology: R = Responsible; A = Accountable; C = Consulted; I = Informed
Key: Agency = El Dorado Water Agency; County = County of El Dorado; EC = Executive Committee; DPTF = Drought Planning Task Force; Public Water Agencies = El Dorado Irrigation District, Georgetown Divide Public Utility District, and Grizzly Flats Community Services District; RDCP = Regional Drought Contingency Plan

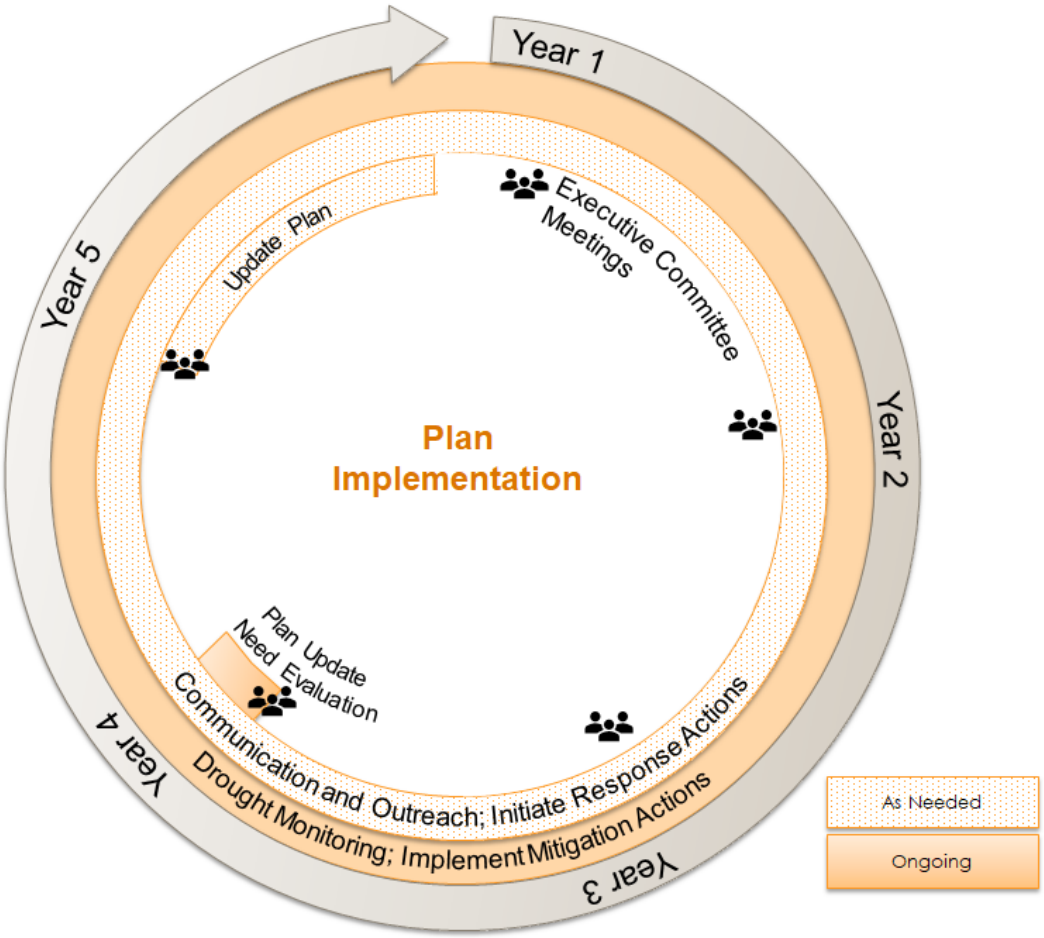
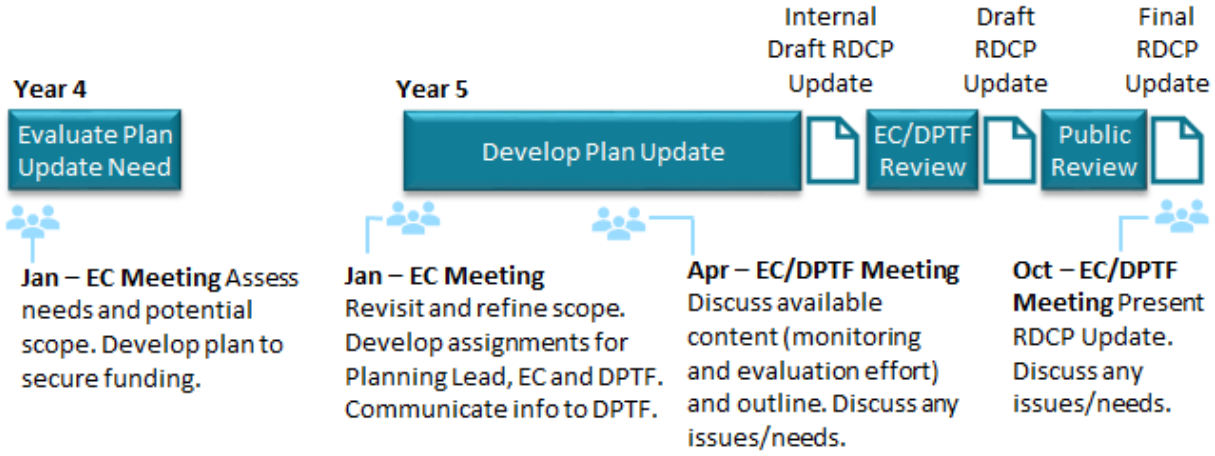


Figure 6-1. Anticipated RDCP Implementation and Update Evaluation Schedule



Key: Apr = April; DPTF = Drought Planning Task Force; EC = Executive Committee; Jan = January; Oct = October; RDCP = Regional Drought Contingency Plan

Figure 6-2. Anticipated RDCP Update Process

6.3.4 Initiation of Drought Response Conditions

As described in **Section 2** and **Section 5**, the Agency will monitor regional drought conditions using the U.S. Drought Monitor data. The regional water supply indicators listed below, as defined by the U.S. Drought Monitor, will provide standard triggers/thresholds to inform the Agency of when to initiate response actions within the planning area.

1. **Early Drought:** The trigger will occur when majority of El Dorado County is first classified as a D2 pursuant to the U.S. Drought Monitor to provide early warning and prompt recognition of when local drought conditions exist or are likely to occur.
2. **Severe/Extreme Drought:** The trigger will occur when majority of El Dorado County is classified as a D4 pursuant to the U.S. Drought Monitor.
3. **Exceptional Drought:** The trigger will occur when majority of El Dorado County is classified as a D5 pursuant to the U.S. Drought Monitor.

Monitoring will be implemented in all years, regardless of the conditions from the previous year, but it is noted that consecutive dry periods are likely to be experienced prior to triggering response actions. In the case that a drought response action is triggered, the Agency will provide media communication to the community and notify the EC so that individual agencies that make up the EC can implement individual drought response actions as noted in **Section 5.**

6.3.5 Triggers to Reassess the UARB RDCP

Although the Agency intends to regularly revisit the UARB RDCP and its performance and assess the need for an update every five years, there may be events or occurrences that affect the local water supply outlook and trigger an update of the UARB RDCP, or a portion thereof, outside of that cycle. These triggers may include, but are not limited to the following:

- **State and federal regulations or requirements** change as new ones go into effect. These may have effects on the availability, timing, and potential uses of water supplies, such as water

conservation requirements, reservoir releases to meet instream flow or water quality requirements, and regulations governing indirect and direct potable reuse.

- **Policy or operational changes** related to State or federal facilities may impact local water resources.
- **New information from drought monitoring activities or other efforts** (climate change or planning studies, modeling efforts, etc.) may also impact the future availability of local water resources.
- **Unanticipated changes in water supply availability** resulting from natural disasters, infrastructure failures, or other events may require reassessment of response and/or mitigation actions.

6.4 Funding and Financing

Implementing, evaluating, and updating the UARB RDCP is contingent on the availability of sufficient funding and financing. This section discusses potential UARB RDCP funding and project financing mechanisms.

6.4.1 UARB RDCP Funding

The Agency provided funds in addition to securing a Reclamation WaterSMART grant to develop the UARB RDCP. The Drought Response Program under WaterSMART aids water managers to develop and update comprehensive drought plans and implement projects that will build drought resiliency. Additional funds for UARB RDCP implementation (not including projects), evaluation, and updates will need to be identified by the individual project leads, and will likely incorporate in-kind services, direct funding by local agencies, and State and federal grant funding opportunities. Updating and maintaining the UARB RDCP will be subject to availability of funds by the Agency and/or through additional state and federal assistance.

6.4.2 Financing Mitigation and Response Actions

Financing projects can be a challenge that may sometimes prevent projects from implementation. In recent years, these challenges have only increased. Municipal and public water agency revenues have been constrained due to pressures to keep user rate increases low, reduced development fees, and lower water usage resulting in reduced revenues. State and federal funding sources are increasingly competitive and sometimes cause schedule delays. Furthermore, some projects with benefits that are difficult to quantify, face challenges in securing external funding. The demands on these limited funds include increasing construction costs, aging infrastructure, and increased regulations.

To realize progress toward drought preparedness and response in the region, mitigation, and response actions (projects) will need to be implemented now and into the future. The Agency, EC, and DPTF recognize the importance of maintaining the highest standards of cost effectiveness for priority projects. Financing options will vary according to each lead agency (project proponent). The various funding sources will differ in their longevity and certainty. While extremely helpful in covering costs, grant program funds will continue to be dependent on successful applications. Grant funds are also better suited to finance construction or a one-time project cost, as opposed to covering operation and

maintenance (i.e., O&M) costs. Generally, user fees and rates are more secure and reliable, and are better suited to cover operation and maintenance costs than relying on grant funding.

Financing for most of the UARB RDCP mitigation and response actions has not been identified at this time. The Agency will help project proponents move forward on an ongoing basis, by providing opportunities to coordinate with other ongoing efforts in the region (e.g., Cosumnes, American, Bear, Yuba Integrated Regional Water Management Group; South Fork American River Cohesive Strategy); encouraging the pursuit of many types of appropriate funding, both external (e.g., grants, loans, development fees, private sector financing) and internal (e.g., user fees, user rates, revenue bonds, assessment districts); and encouraging the formation of partnerships for those projects that benefit multiple water agencies and stakeholders.

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