Upper American River Watershed Group

Programmatic Watershed Plan

November 2, 2023

El Dorado Water Agency

With Support from

Stantec

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Upper American River Watershed Group

Programmatic Watershed Plan

November 2, 2023

This Programmatic Watershed Plan was prepared under the direction of the Upper American River Watershed Group, supplemented by extensive consultations with pertinent subject matter experts, partner agencies, and organizations.

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The El Dorado Water Agency convened the Upper American River Watershed Group as a specialized subgroup, tasked with the objective of fostering collaborative watershed management in alignment with the principles outlined in the charter of El Dorado Countywide Plenary for Water.

We are proud to embark on this change from past passive management of the upper American River watershed to a proactive, collaborative action plan to preserve our watershed and the values it brings to communities, the State, and future generations.

The upper American River watershed experienced many serious wake-up calls in recent years. The 2020-2022 drought happened soon after the 2012-2016 drought, resulting in many aggressive measures by the State for emergency drought mitigation including new regulations. These measures had complex consequences and lacked consideration of our unique local conditions being a headwater and foothill environment. The COVID-19 pandemic created an urban exodus, with this watershed being one of the most moved-in regions in the state during that time and changed the demographics within our watershed. Additionally, wildfires plagued the entire state in recent years and our watershed was no exception – we received a blunt hit by the 2021 Caldor Fire that devastated our communities, including historical Grizzly Flats which still faces a long road to recovery, only to be followed by the 2022 Mosquito Fire. Further, the Caldor Fire spread to the Tahoe Basin across the Continental Divide in a way that was once thought unlikely. Yet another disaster our watershed experienced was the bomb storms in early 2023 which resulted in communities being flooded all while still being under an active statewide drought emergency. These communities, in our mostly rural-agricultural setting, and the ecosystem in our watershed were overwhelmed and cannot be corrected solely by natural processes.

In August 2022, U.S. Department of the Interior, Bureau of Reclamation, released the American River Basin Study, which was prepared in collaboration with water managers and interested parties in the American River watershed to identify the potential water supply-demand imbalance under climate change conditions and to develop several watershed-scale climate adaptation portfolios. El Dorado Water Agency, Placer County Water Agency and other regional partners contributed significantly to help craft our own future that fits our unique conditions. Modernized watershed management and particularly forest management were identified as common elements for all portfolios. This Programmatic Watershed Plan is the first important step toward this goal. We are honored to have the opportunity to facilitate the Upper American River Watershed Group and its development of this Programmatic Watershed Plan. We look forward to continued collaboration and expanded cooperation with all our watershed partners, as well as State and federal agencies, to actively improve watershed sustainability and community resilience for our future generations.

With great appreciation,

Lori Parlin
Board Chair
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and El Dorado County Supervisor, District IV

Rebecca Guo, PE
General Manager
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Executive Summary

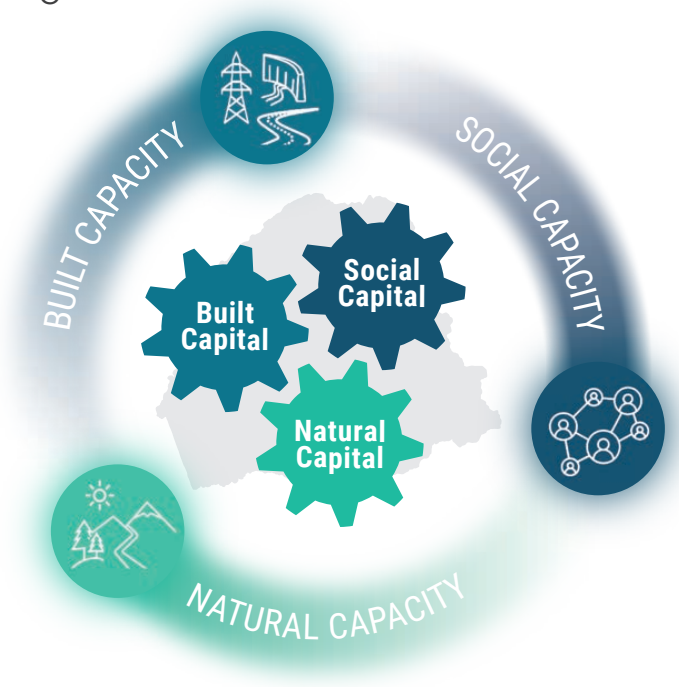
The upper American River watershed is facing substantial threats from various recent disasters including wildfires, pandemic, droughts, and floods. Communities at large were heavily impacted and unprepared for such a drastic increase of stresses on the ecosystem and on our everyday life. The level of disruption and damage from these types of events is expected to be further exacerbated as the effects of climate change continue to manifest. We are at a critical junction in watershed management to preserve the substantial ecosystem goods and services (EGS) provided by the upper American River watershed to local communities, as well as those in the lower American River watershed, and of state and national levels. We need urgent actions to improve resilience for the upper American River watershed and the communities within, and change our passive management of the precious landscape within the watershed to a progressive one. With collaboration and cooperation among all responsible parties and beneficiaries, we can create and realize a cohesive vision for watershed management that is sustainable and equitable to preserve our watershed for future generation. This Programmatic Watershed Plan (PWP) is the first step toward this shared future.

The El Dorado Water Agency (EDWA) convened an Upper American River Watershed Group (UARWG), which consists of local, state, and federal agencies with watershed responsibilities, Tribes, non-profit organizations, business and economic interests, academics, and other interested parties, to collaborate on the development of a shared vision of needed efforts to create a sustainable future for our watershed. This was funded in part through a grant from the Department of the Interior, Bureau of Reclamation's WaterSMART Cooperative Watershed Management Program. EDWA convened the group and facilitated PWP development consistent with their authority provided by the 1959 El Dorado County Water Agency Act (Act), which provides expectations for EDWA to address water resource matters that cannot be accomplished solely by individual entities in the watershed.

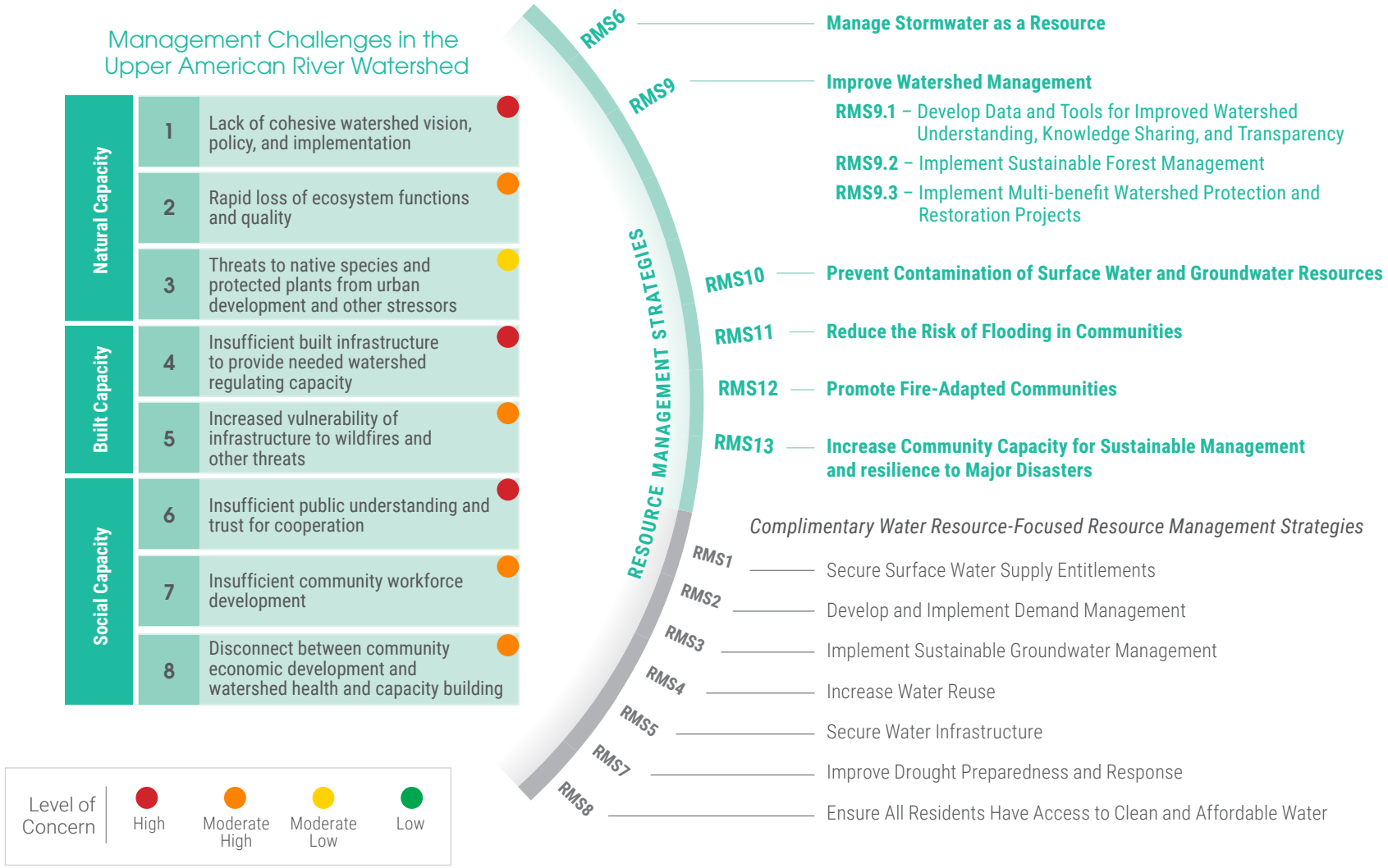
Active Watershed Management for Capacity Building

The PWP presents a holistic approach to leverage natural, built, and social capitals to create and reinforce the expansion of natural, built, and social capacities for watershed sustainability and community resilience. In this context, capital means the physical and non-physical (e.g., institutional and trust) assets and resources within the associated natural, built, or social environments; capacity means the ability leverage available and accessible capital to create individual and watershed-wide benefits.

During the process of deliberating a shared vision for sustainable watershed management, the UARWG found one of our greatest risks is the lack of properly recognizing the true value of the watershed. The vast amount of EGS provided by the upper American River watershed is substantial and benefits the communities within the upper watershed and beyond. As a result, the UARWG developed this PWP based on a working landscape concept that recognizes the importance of supporting elements to protect, realize, and enhance the EGS provided by the watershed.



The Programmatic Watershed Plan lays out the identified resource management strategies and focused management actions to alleviate and mitigate identified watershed management challenges for collective implementation by partners. The complementary water resource-focused resource management strategies developed though complementary planning efforts are incorporated by reference.



While the natural, built, and social capacities may be subject to certain physical or institutional limits, they are not fixed, and their corresponding levels of achievement depend on how we use and maintain these capitals in a coordinated, cooperative, and responsible manner. An active planning and management approach that considers and integrates actions across all watershed management aspects is the key to avoiding pitfalls and mitigating the resulting vulnerabilities of the watershed and communities within.

Policy-Oriented Planning Practice and Collective Implementation

The UARWG developed the PWP based on the concept of collective implementation that respects the role and responsibilities of each watershed manager and entity. The identified resource management strategies (RMS) and associated management actions provide directions for further project formulation, refinement, approval, and implementation.

Primary implementation agencies are encouraged to form long-term or project-specific partnerships for advancing work toward overall success and leveraging funding opportunities provided by federal and state policy directives. For this reason, PWP implementation needs our collective efforts to help maintain, foster, and enhance natural, built, and social capacities for long-term sustainable watershed management and community resilience.

The PWP also includes an initial compilation of known and planned watershed improvement projects from various agencies and entities within the watershed, combined with preliminary assessments on project readiness and their contributions to the shared vision and identified watershed needs in the PWP. The project evaluation is demonstrative in nature to assess the potential accomplishments and alignments with the identified PWP goal and RMS, as well as their readiness and level of support for available funding opportunities. Consistent with the holistic view taken in developing this PWP, recent State and federal assistance and project-specific funding often require a clear demonstration of multi-benefit formulation that is beyond mitigation requirements, and evidence of broad, regional support. However, it is also recognized that unique criteria or changes in State and federal policy preference may occur in the future.

The UARWG conducted the project evaluation in this first PWP process to provide needed feedback to project proponents to further improve their projects for early implementation to benefit the watershed. The adopted evaluation approach provides a durable structure of evaluation criteria for project evaluation for future consistent applications and includes sufficient flexibility in metric use for necessary customization to address preferences imposed by funding opportunities and where applicable, adjustments to improve the overall outcome based on the stage of PWP implementation and changed conditions identified by the UARWG partners.

Streamlined Structure for Continued Collaboration

The UARWG recognizes the potential of a fast-changing future on watershed management due to landscape-scale disasters and continued manifestation of climate change effects. This PWP is a living document that will be subject to periodic reviews for changed conditions and incorporation of necessary adjustments in management actions and priorities based on implementation outcomes and lessons learned.

The UARWG prepared the PWP in a concise and structured format that facilitates streamlined periodic updates and communication. The resulting policy plan provides stable guidance for all watershed managers and interested parties to channel concerted energy toward continued collaboration and desired outcomes. The PWP is subject to a 5-year updates in years ending in 3 and 8. The UARWG has identified the needs of performance measures for guiding further development and implementation of the PWP as one focused area for continued collaboration and a topic for 2028 update.

The continued collaboration among the UARWG partners will rely on the efficient and streamlined structure EDWA established for this PWP development. The UARWG is a collaborative group established under the El Dorado Countywide Plenary for Water (Plenary). The Plenary was formed under the direction of EDWA's Board of Directors to be a standing forum for consistent and proactive communication and engagement with the public and interested parties to promote transparency and constructive dialogue among countywide and regional partners to advance water resource management in EDC and beyond. The standing status of the Plenary and thus, the UARWG, provides necessary assurance for the participating partners. The Plenary also provides an additional pathway of communication to advocate for and collaborate on watershed management. EDWA committed to serve as the convener for the UARWG to facilitate continued development and implementation of the PWP.

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Acknowledgments

The Upper American River Watershed Group would like to thank the following individuals for their input on the Programmatic Watershed Plan.

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Abbreviations and Acronyms

AB	Assembly Bill
Act	El Dorado County Water Agency Act
BLM	U.S. Department of the Interior, Bureau of Land Management
CAL FIRE	California Department of Forestry and Fire Protection
EDC	County of El Dorado
EDWA	El Dorado Water Agency
EGS	Ecosystem Goods and Services
EID	El Dorado Irrigation District
FEMA	Federal Emergency Management Agency
FSC	Fire Safe Councils
PC	County of Placer
PCWA	Placer County Water Agency
Plenary	El Dorado Countywide Plenary for Water
Planning Area	The same as the upper American River watershed as defined in this PWP Watershed Program
PWP	Programmatic Watershed Plan
RCD	Resource Conservation District, including El Dorado County Resource Conservation District, Georgetown Divide Resource Conservation District, and Placer Resource Conservation District
Reclamation	U.S. Department of the Interior, Bureau of Reclamation
RMS	Resource Management Strategies
SB	Senate Bill
SMUD	Sacramento Municipal Utility District
SNC	Sierra Nevada Conservancy
Tahoe Basin	Areas in El Dorado County located on the east of the Sierra Nevada Crest
Tribes	Native American tribes, including Shingle Springs Band of Miwok Indians and United Auburn Indian Community
UARWG	Upper American River Watershed Group
U.S.	United States
USDA	U.S. Department of Agriculture
USFS	U.S. Department of Agriculture, Forest Service
West Slope	Foothill areas in El Dorado County located on the west of the Sierra Nevada Crest
WRDMP	Water Resources Development and Management Plan
WUI	Wildland-Urban Interface

Photo Credits

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Glossary

This glossary provides definitions of key terms used in this PWP. Where available, definitions from statute and regulations are adhered to. Certain terms could have alternative definitions among scholars and practitioners depending on their context of use; this compilation reflects the intended use in this PWP.

Built capacity — The ability of built capital to deliver ecosystem goods and services.

Built capital — All man-made physical infrastructure and assets within a geographic area that enable, facilitate, or enhance use of natural and social capitals.

Community water system — A public water system that serves at least 15 service connections used by yearlong residents or regularly serves at least 25 yearlong residents of the area served by the system (California Health and Safety Code Section 116275).

Domestic well — A groundwater well used to supply water for the domestic needs of an individual residence or a water system that is not a public water system and that has no more than four service connections (California Health and Safety Code Section 116681).

Ecosystem goods and services — The conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life. In general, ecosystem goods are tangible and quantifiable products derived from the natural environment, including resources such as water, timber, fish, and agricultural crops, which directly support human livelihoods and well-being. Ecosystem services refer to the diverse range of ecological processes, functions, and benefits, including water purification, flood regulation, soil fertility, biodiversity support, and recreational opportunities, that directly and indirectly contribute to human welfare and the overall health of the watershed environment.

Fire Hazard Severity Zone — Geographical areas designated pursuant to California Public Resources Codes Sections 4201 through 4204 and classified as Very High, High, or Moderate in State Responsibility Areas or as Local Agency Very High Fire Hazard Severity Zones designated pursuant to California Government Code, Sections 51175 through 51189. See California Fire Code Chapter 49 (California Building Code, Chapter 7A, Section 702A).

Local Agency Very High Fire Hazard Severity Zone — An area designated by a local agency upon the recommendation of the California Department of Forestry and Fire Protection (CAL FIRE) Director pursuant to Government Code Sections 51177(c), 51178 and 5118 that is not a state responsibility area and where a local agency, city, county, city and county, or district is responsible for fire protection. (California Building Code, Chapter 7A, Section 702A)

Local Responsibility Area — Areas of the state in which the financial responsibility of preventing and suppressing fires is the primary responsibility of a city, county, city and county, or district (California Building Code, Chapter 7A, Section 702A).

Natural capacity — The ability of natural capital to deliver ecosystem goods and services.

Natural capital — The entirety of renewable and non-renewable natural resources, as well as the physical and ecosystems that contain them and their natural functions and processes, within a geographical area that contribute to the well-being of both human societies and the environment within the specific area.

Natural lands — Areas of land that are primarily characterized by their relatively undisturbed and unaltered ecological state. These lands often include forests, wetlands, grasslands, rivers, lakes, and other ecosystems that have been minimally impacted by human activities.

Nature-based solution — Nature-based solutions are sustainable planning, design, environmental management, and engineering practices that weave natural features or processes into the built environment to promote adaptation and resilience.

Resource Management Strategy — A broad set of tools that may include techniques, programs, or policies that can be used to meet management needs of the watershed as a whole.

Social capacity — The potential ability to obtain resources, favors, and information by individuals within a society working together to effectively achieve a common purpose that reflects their shared values.

Social capital — The aggregate of the actual or potential resources associated with a durable network of institutionalized relationships of mutual acquaintance and recognition that facilitate coordination and cooperation for mutual benefits.

State Responsibility Area — Lands that are classified by the California Board of Forestry and Fire Protection as the state having the primary financial responsibility of preventing and suppressing forest fires (California Building Code, Chapter 7A, Section 702A).

State small water system — A system for the provision of piped water to the public for human consumption that serves at least five, but not more than 14, service connections and does not regularly serve drinking water to more than an average of 25 individuals daily for more than 60 days out of the year (California Health and Safety Code Section 116275 (n)).

Small water supplier — A community water system serving 15 to 2,999 service connections, inclusive, and that provides less than 3,000 acre-feet of water (California Water Code Section 10609.51(k)).

Upper American River watershed — The geographic scope for planning purposes by the Upper American River Watershed Group, including the American River hydrologic watershed above Folsom Dam and a portion of the Cosumnes River hydrologic watershed within El Dorado County, for which resource management practices and responsibilities are jurisdictionally and managerially integrated.

Watershed — A land area that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays, and the ocean.

Wildland-Urban Interface — The zone of transition between unoccupied land and human development. It is the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. In California, this term is synonymously with Wildland-Urban Interface Fire Area, which is defined in California Building Code, Chapter 7A, Section 702A and delineated as a geographical area identified by CAL FIRE as a Fire Hazard Severity Zone, or other areas designated by the enforcing agency to be at a significant risk from wildfires.

Wildfire — Any uncontrolled fire spreading through vegetative fuels that threatens to destroy life, property, or resources as defined in Public Resources Code Sections 4103 and 4104 (California Building Code, Chapter 49, Section 4902)

Working Lands — Areas of land that are actively used for productive purposes, such as agriculture, forestry, ranching, and other forms of land-based economic activities. These lands play a crucial role in providing a range of ecosystem goods and services, including the production of food, fiber, timber, and other resources, as well as contributing to biodiversity, soil health, water quality, and carbon sequestration.

Working Landscape — A cohesive unit of land that is ecologically, socially, and economically connected; it can include both working lands and natural lands.

1

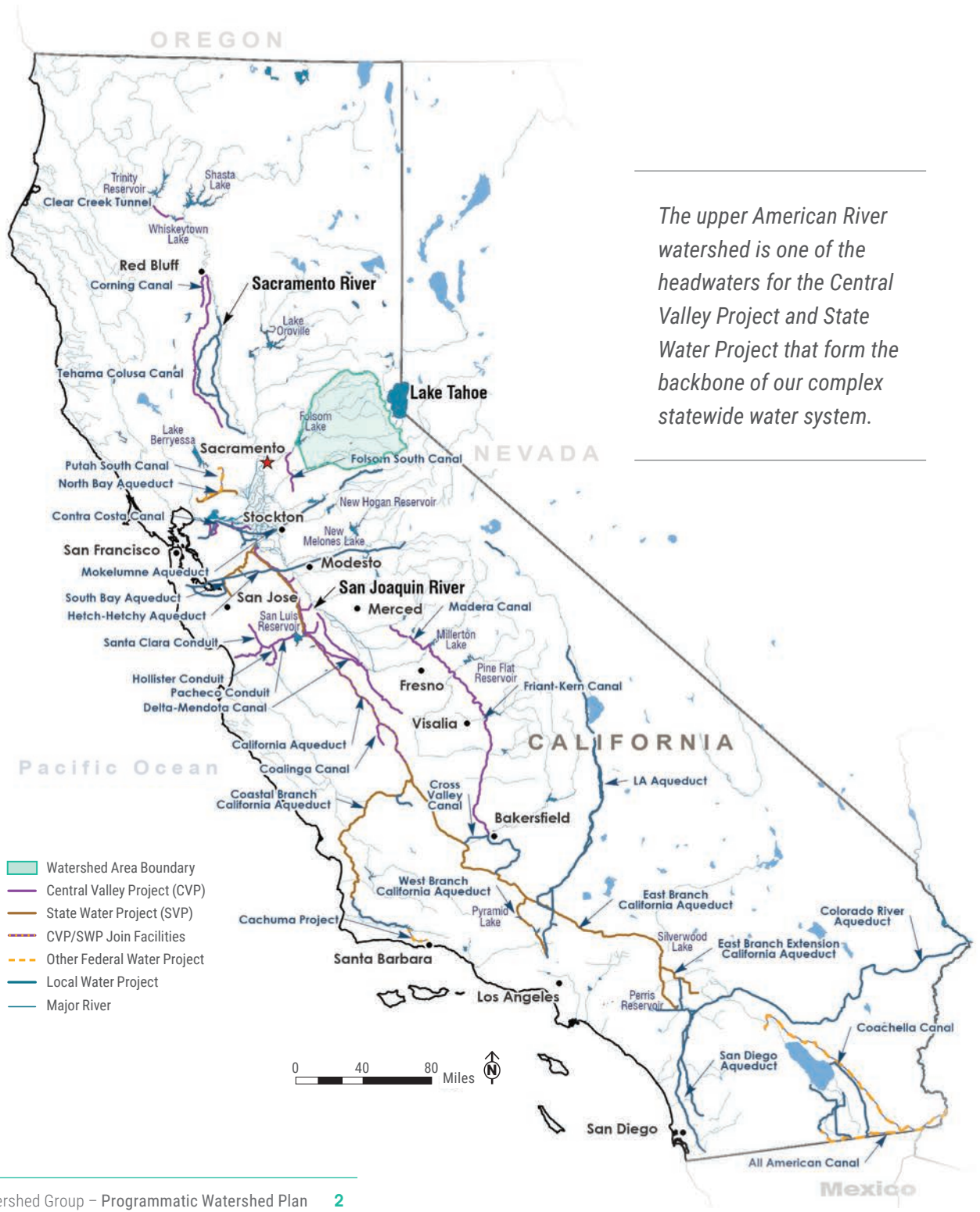
Introduction

This Programmatic Watershed Plan (PWP) for the upper American River watershed is a policy document prepared by the Upper American River Watershed Group (UARWG), which consists of local, regional, state, and federal agency partners. The PWP outlines resource management strategies (RMS) and key management actions for sustainable, climate-resilient watershed management.

This PWP is intended to provide guidance for aligning efforts of agencies and partners with varying roles and responsibilities in the watershed toward a shared vision to improve the effectiveness and efficiency of their collective actions to improve watershed sustainability and community resilience for future generations.

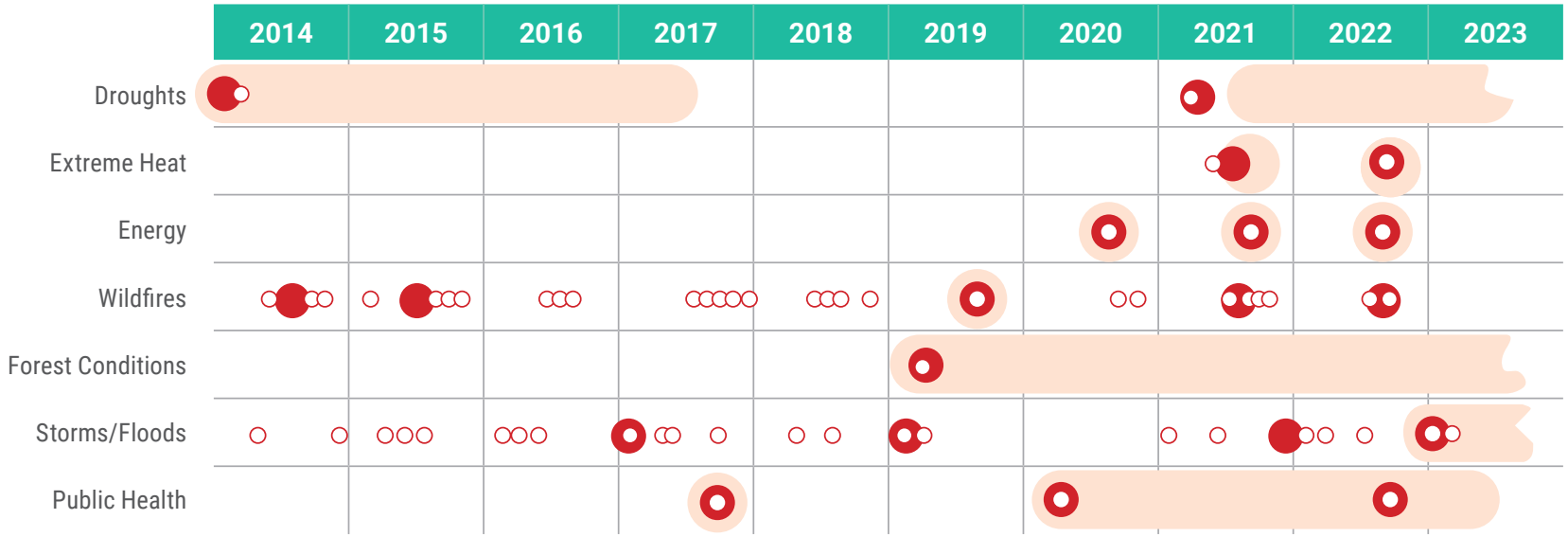
1.1 Need for Action

The upper American River watershed provides many benefits to the communities that reside within and beyond its borders. Its water and natural resources not only sustain indigenous and rural-agricultural traditions, but also contribute to the socioeconomic advancement of local communities. The headwaters also provide water for downstream consumptive and environmental beneficial uses in the lower American River watershed in the Sacramento metropolitan area and a substantial portion of the state. As a result, the State Legislature formalized a state policy through Assembly Bill (AB) 2480 of 2016 to recognize that the headwaters (e.g., those in the upper American River watershed) are integral components of California's water infrastructure with far-reaching impacts on statewide economy.



The upper American River watershed is one of the headwaters for the Central Valley Project and State Water Project that form the backbone of our complex statewide water system.

The trend of increasing emergency proclamations by the Governor of California reflects the evolving and compounded conditions of natural- and human-caused hazards and disasters that create significant stress on the economy, environment, and local communities.

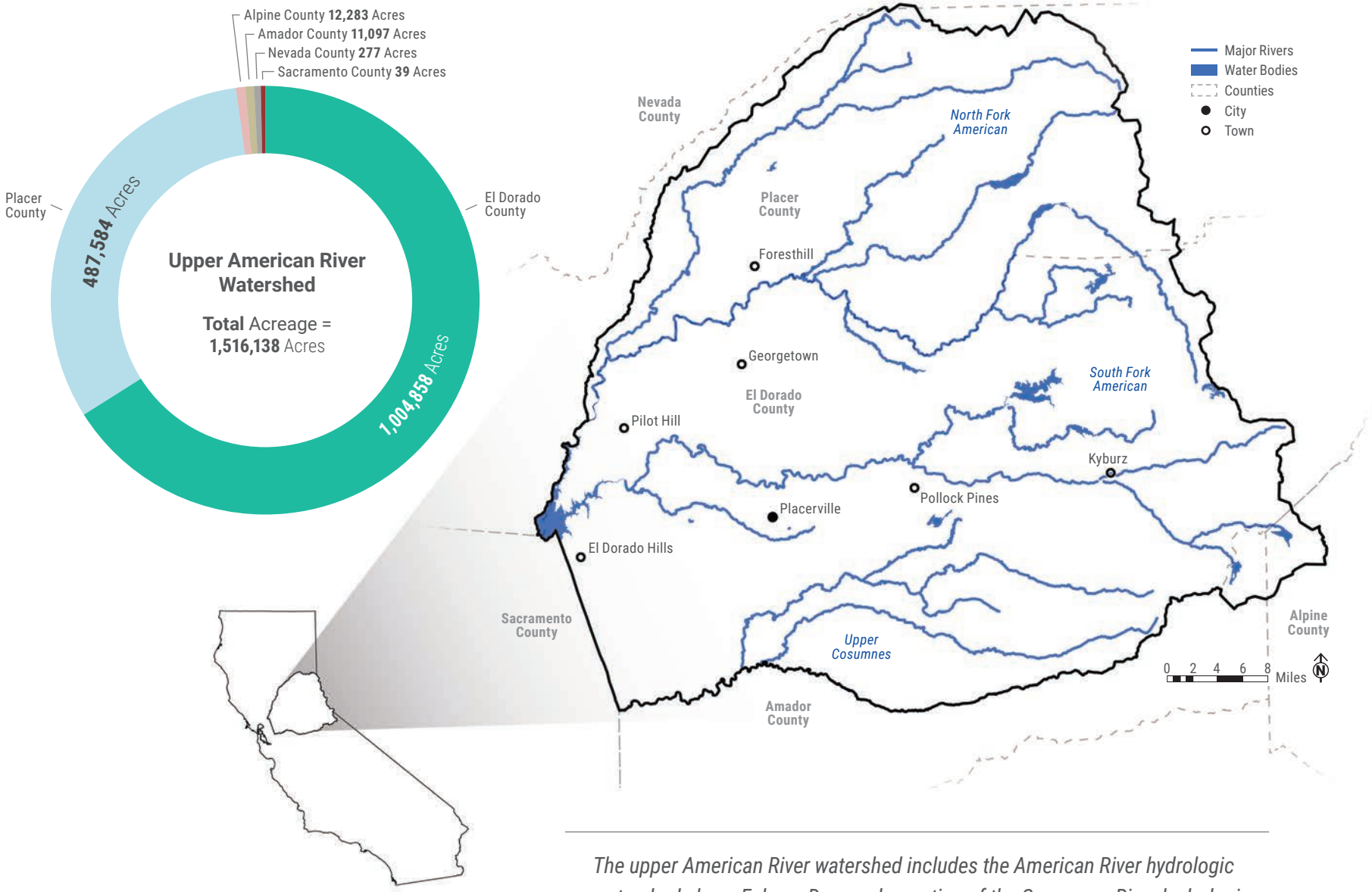


Affected Area by Governor's Proclamation of a State of Emergency

- Counties other than El Dorado
- Counties including El Dorado
- All Counties

Notes:

1. El Dorado County was used as a surrogate for the upper American River watershed. The declaration of emergency is by county, except for incidents that is statewide, covering all counties.
2. Not all end dates of emergency are noted. Emphases were on droughts, forest conditions, and public health for context.



The upper American River watershed includes the American River hydrologic watershed above Folsom Dam and a portion of the Cosumnes River hydrologic watershed within El Dorado County, for which resource management practices and responsibilities are jurisdictionally and managerially integrated.

Recently, the upper American River watershed experienced multiple states of emergencies, leading to significant challenges for both the communities and ecosystems within the watershed, as well as those reliant on its resources. The frequency and intensity of droughts are on the rise, wildfires are becoming increasingly devastating, and forest health is declining. These circumstances have laid bare the vulnerabilities inherent in the present passive approach to forest and overall headwater management, which are pivotal for providing public safety, climate resilience, and economic prosperity for our communities. The devastating impacts of the 2021 Caldor Fire and 2022 Mosquito Fire on the watershed and affected communities cannot be overstated, and the road to recovery is long.

The upper American River watershed is not alone in this crisis. Pervasive conditions have prompted broad acknowledgment that enduring and sustainable solutions can only emerge through a holistic watershed management approach, rooted in a robust understanding of interconnectedness of natural and manmade resources, and their seamless integration. While new approaches are undergoing experimentation, such as the initiatives championed by the Sierra Nevada Conservancy (SNC) through their Tahoe-Central Sierra Initiatives, there remains a need for further action.

Despite increasing awareness of the effectiveness and manifold advantages of nature-based solutions and notable progress made, challenges persist in their comprehensive integration into the development of sustainable climate adaptation strategies. Frequently, climate adaptation approaches place excessive reliance on technological solutions or equate innovation solely with technology. Rather, nature-based solutions can embody innovation and harmoniously complement the necessary technological and infrastructural measures. This foundational shift in mindset is paramount for the future of the upper American River watershed and overarching PWP objectives.

Further, institutional and financial challenges also plague the implementation of watershed improvement. The missed opportunities for coordinated actions among agencies sharing roles and responsibilities in watershed management have led to fragmented and ineffective implementations. Equitable financial mechanisms for long-term headwaters protection have not been developed. Occasionally available public financing opportunities, including funding available through the Infrastructure Investment and Jobs Act of 2021 and Inflation Reduction Act of 2022, and similar State bond measures and assistance programs, allow incremental progresses, but sustainable funding sources for long-term implementation remain intangible. A holistic approach is required for the upper American River watershed, as embodied by the PWP, that provides potential new pathways to overcome these barriers.

Insight from the American River Basin Study

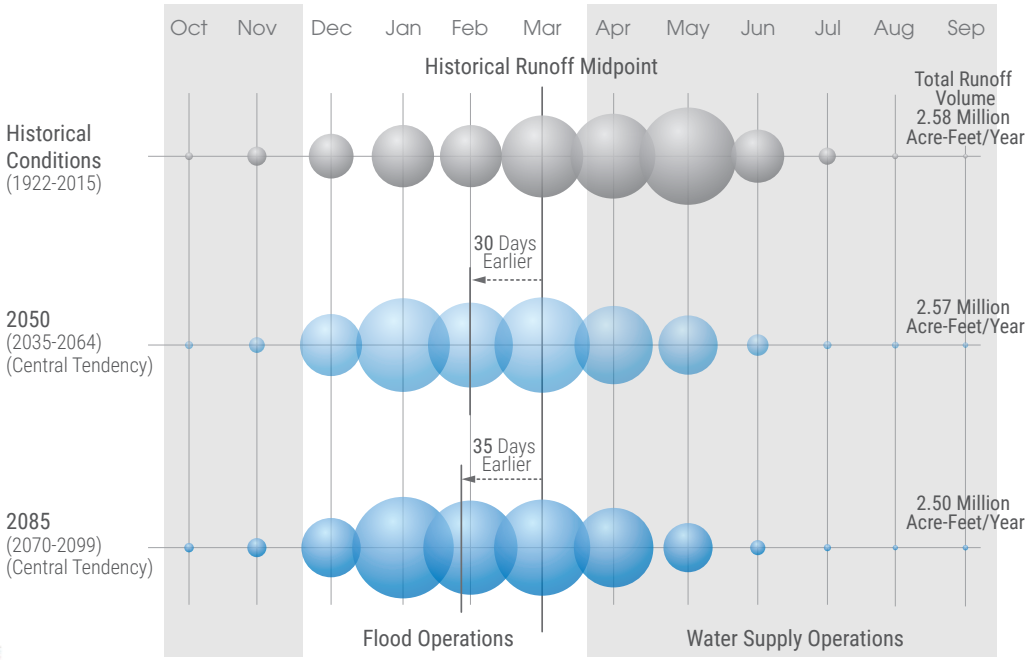
Water is one of the primary conduits through which climate change is manifesting its influence on the natural and built environments. Reclamation and regional partners, including Placer County Water Agency (PCWA), El Dorado Water Agency (EDWA), City of Roseville, City of Sacramento, City of Folsom, Sacramento Area Flood Control Agency (SAFCA), and Regional Water Authority, completed the American River Basin Study in 2022 to develop landscape-scale, regionally-supported climate adaptation strategies.

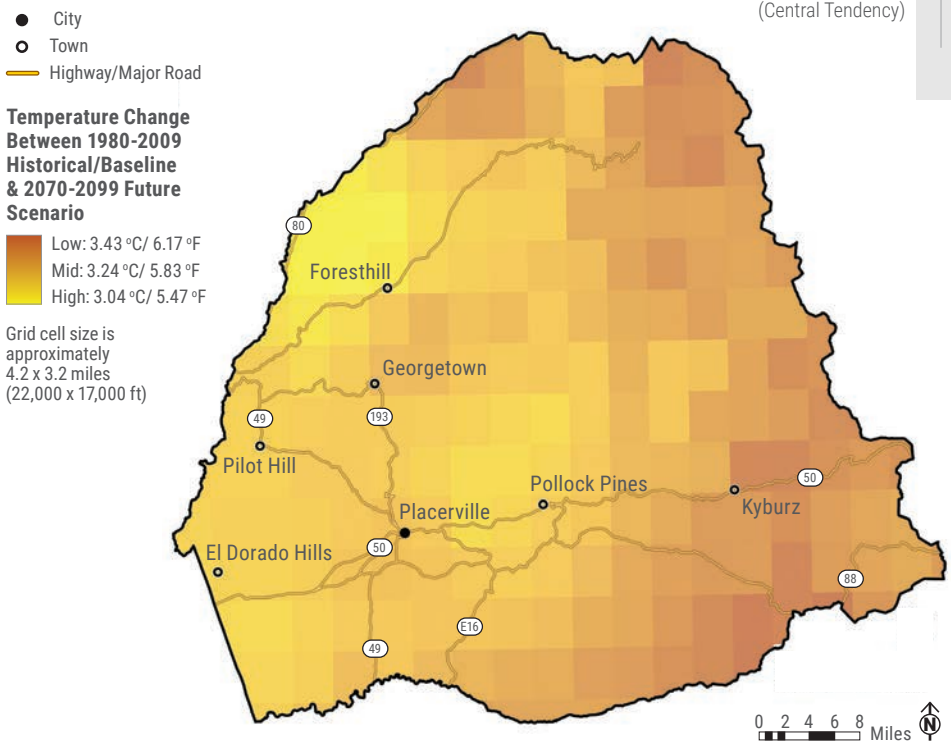
Through the American River Basin Study, Reclamation and its regional partners identified the projected water supply-demand imbalances volumetrically and geographically under climate change conditions, and developed basin-scale, geographically appropriate climate adaptation to address the identified imbalances. Although water-focused, the in-depth study provides a sobering snapshot of a troubled future under climate change. The projected temperature increase and change in seasonal runoff patterns will have significant effects on regional economy, public health, and other effects extending from water availability, drought resilience, and flood management.

To address varying vulnerabilities in the American River Basin under climate change, the American River Basin Study includes six adaptation portfolios for further development. Among all the portfolios, the Alder Creek Water Storage and Conservation Portfolio in the upper American River watershed is designed to address the unique vulnerabilities of foothill communities, where groundwater in fractured bedrock is unreliable during droughts and the watershed's steep terrain necessitates an upstream solution for the loss of snowpack under climate change. Snowpack has historically provided vital regulating capacity for water supply to areas in El Dorado County (EDC) west of the Sierra Nevada Crest (i.e., the West Slope). The vast West Slope is mostly rural-agricultural, with limited urbanization along Highway 50 and near the Sacramento County border.

Two other adaptation portfolios related to water management by PCWA in the upper American River watershed in Placer County have primary actions in the lower American River Basin to diversify their sources of water supply through exchange and expanded groundwater banking. A watershed-scale forecast-informed reservoir operation led by SAFCA for addressing the increasing flooding risks in the basin due to climate change, particularly in the lower basin in the Sacramento metropolitan areas, is another customized portfolio that combines upstream storage facility improvements with Folsom Reservoir operation, leveraging advancements of technology and forecasting.

The American River Basin Study shows alarming concerns over water supply and flood under climate change conditions. While the estimated total full natural or unimpaired flow to Folsom Reservoir remains relatively the same, the shift of seasonal distribution and change in precipitation form from snow to rain suggest substantial challenges for ecosystem and communities within the watershed.





Under climate change conditions, the average annual temperature in the upper American River watershed is projected to increase by up to seven degrees Fahrenheit by 2100.

All adaptation portfolios include forest management for improved watershed conditions and fuel management, and headwaters restoration for water supply and quality benefits. It is understood that these common measures have far-reaching benefits beyond water-focused objectives. The formation of the UARWG and development of this PWP is part of the implementation of common elements recommended in the American River Basin Study.

1.2 Goal and Objectives

As an action to implement the headwaters management component that is common to all adaptation portfolios of the American River Basin Study, EDWA secured the WaterSMART Cooperative Watershed Management Program Phase I Grant in 2021 from Reclamation to establish the UARWG to foster watershed-scale collaboration. EDWA also acted as a convenor to develop the PWP, a role that is consistent with authority of its 1959 El Dorado County Water Agency Act to facilitate and support watershed management-related activities in support of its primary mission to secure adequate water supply and quality for future generations in El Dorado County.

The UARWG set the goal of the PWP as the following:

> ***"To establish a cohesive and shared vision for sustainably managing the upper American River watershed for long-term resiliency and community prosperity."***

To accomplish this goal, the group further establish the following objectives:

- Develop a concise, adaptable, and policy-level plan that guides the realization of equitable benefits throughout the upper American River watershed and beyond through collective implementation by corresponding responsible parties.
- Identify management actions with an integrated resource management approach that recognizes the broad value and benefits of the upper American River watershed and promote multi-benefit investments with collaboration.
- Incorporate adaptive management for accommodating evolving risks associated with changes in physical and regulatory conditions in the watershed, and the state of understanding of climate change and its effects on the natural, built, and social environments of the upper American River watershed.

1.3 Development Principles

The UARWG identified the following set of planning principles for developing the PWP:

- **Respect the roles and responsibilities of local, regional, state, and federal agencies and entities**. Each partner has different roles, responsibilities, and priorities for implementing the PWP. The PWP does not modify existing authorities or responsibilities of each partner but encourages collaboration and multi-benefit implementation.
- **Promote dialogue and transparency among local, regional, state, and federal agencies, Tribes, interested parties, and the public, and a shared understanding of the collective and individual investment priorities**. The shared vision for the watershed can only be achieved through collaboration, common understanding, and recognition of mutual benefits.
- **Recognize the need to deploy all available, proven science- and evidence-based solutions to battle our climate crisis to improve opportunities for our watershed's future**. The integration of nature- and infrastructure-based solutions, technology advancements, education, and knowledge sharing are essential for a holistic approach 21st Century watershed management.
- **Leverage the socioeconomic and intrinsic values of the upper American River watershed to facilitate development of equitable and sustainable funding for long-term implementation**. Proper valuations of the upper American River watershed's intrinsic value to local, regional, statewide, and National interests can reinforce the concept of beneficiary pay and provide the needed foundation for alternative financing mechanisms for watershed management.
- **Enhance efficiency and effectiveness in plan development by leveraging data and information of existing relevant programs and projects, and established venues of collaboration**. In addition to the American River Basin Study, the PWP incorporates water resource-related challenges and RMS, with necessary refinements and augmentation to address watershed planning needs fully, from EDWA's 2019 Water Resources Development and Management Plan (WRDMP), a countywide policy plan for integrated water management. For efficiency, the UARWG was organized as a specialized subgroup pursuant to the charter of the El Dorado Countywide Plenary for Water.

1.4 Organization

This PWP for the upper American River watershed consists of an executive summary and six chapters as described below:

Chapter 1: Introduction describes the need for a new holistic approach to watershed management for long-term sustainability and community prosperity and outlines the goal and planning principles for PWP development.

Chapter 2: Watershed Management provides an overview of current management of the upper American River watershed and primary responsible parties, thus establishing the necessary context for identifying watershed management challenges and developing RMS.

Chapter 3: Challenges provides an overview of major challenges the watershed is currently facing and will face in the projected future under climate change conditions.

Chapter 4: Resource Management Strategies provide high-level strategies and identified management actions to mitigate identified watershed challenges and includes corresponding roles and responsibilities of partners in the UARWG and others for collective implementation.

Chapter 5: Prioritized Projects summarizes the process and outcomes of identified projects to improve long-term watershed health and community resilience and their prioritization as required.

Chapter 6: Implementation describes PWP implementation considerations for the continued development of the Upper American River Watershed Program and collaboration of the UARWG to promote long-term sustainability and resilience in the upper American River watershed.

2

Watershed Management

This chapter describes an overview of the natural resources, major infrastructure, and communities within the upper American River watershed, along with an exploration of the key entities responsible for its management and oversight.

2.1 Watershed Overview

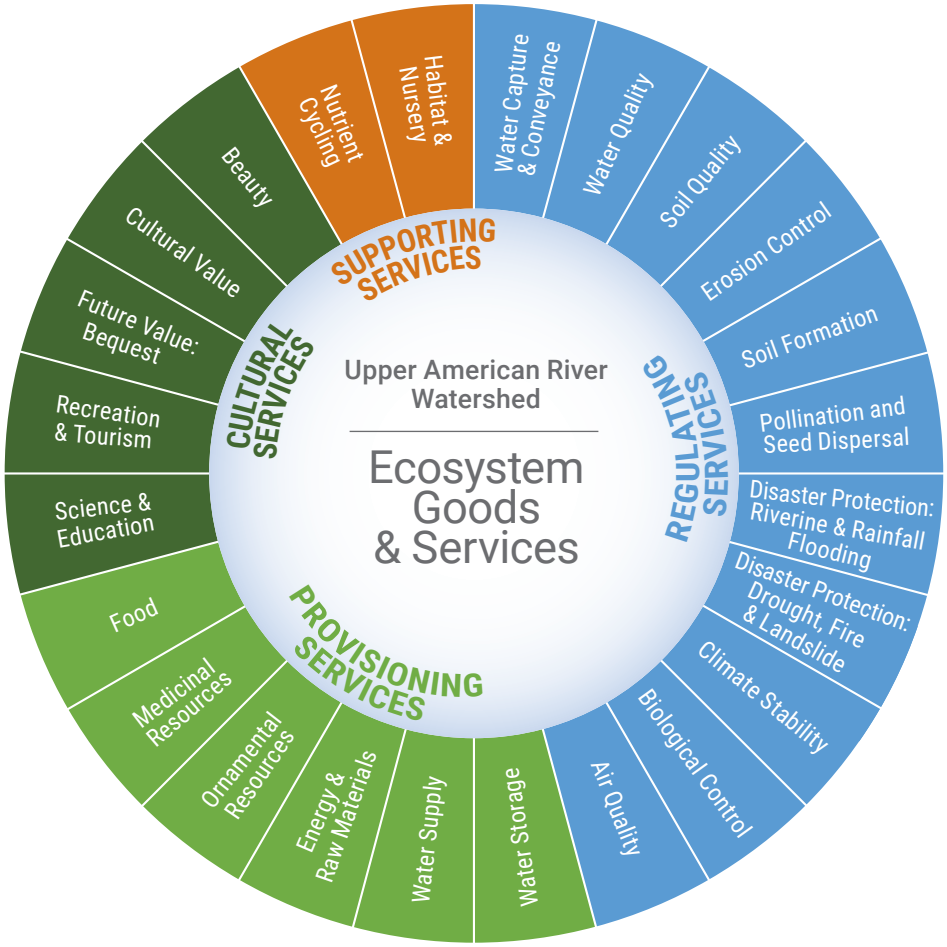
Lands in the upper American River watershed are largely rural-agricultural, featuring farms, rangelands, forests, wetlands, shrublands, rivers, lakes, and alpine meadows. The watershed has a vibrant, rural way of life sustained by the land, which is the backbone of the local economy, watershed health, and community prosperity. The portion of the Cosumnes River hydrologic watershed included in the upper American River watershed for planning purposes in this PWP is home to a variety of ecosystems, including forests, grasslands, wetlands, and rivers as well as natural resources, including water, timber, and wildlife.

The upper American River watershed provides both natural and built storage capacities to capture runoff and protect downstream areas from the effects of drought and floods. The water produced by the watershed flows into Folsom Reservoir, which is a critical storage feature of Reclamation's Central Valley Project that supplies municipal, industrial, and agricultural water users in the greater Sacramento region, the Sacramento-San Joaquin Delta, and the San Joaquin Valley. The Central Valley Project provides water to 7 of the top 10 agricultural counties in the nation's leading farm state and, to a much lesser degree, municipal and industrial water supplies to communities in the Central Valley and the San Francisco Bay Area. It has been estimated that the value of crops and related service industries has returned 100 times Congress' original $3 billion investment in the Central Valley Project. Folsom Reservoir also supports renewable energy production.

The snowpack and cold-water resources in the upper American River watershed are crucial for Reclamation's water temperature management efforts in the lower American River for listed and protected fishery species and contribute significantly to water quality management in the Sacramento-San Joaquin Delta. Further, the coordinated operation of Folsom Reservoir by Reclamation and the U.S. Army Corps of Engineers for water supply and flood management, respectively, in conjunction with downstream facilities of the State Plan of Flood Control and Sacramento Flood Control Project, provide significant flood protection to the Sacramento metropolitan area.

Additionally, a significant portion of lands in the upper American River watershed are public lands that provide abundant wilderness and recreation opportunities that are enjoyed by residents and visitors from California, other parts of the U.S., and internationally. Much of these public lands are managed by the U.S. Department of Agriculture (USDA), Forest Service (USFS), and to a lesser degree, the U.S. Department of the Interior, Bureau of Land Management (BLM). Natural habitats and ecosystems in the watershed are important to a diverse range of resident and migrating species, including fish and wildlife species of national importance.

The upper American River watershed provides a diverse range of ecosystem goods and services, including cultural, regulating, provisioning, and supporting services. These services are essential to the health and well-being of the watershed and its inhabitants, and properly maintained services are foundational to protect the watershed for future generations.



2.2 Natural Capital and Working Landscape

Nature provides watersheds with a large stock of natural capital, be it water, soil, air, minerals, living organisms, or other natural assets. This natural capital provides the foundation for working landscapes that deliver economic and environmental benefits.

A working landscape is a cohesive unit of land that is ecologically, socially, and economically connected; it can include both working lands and natural lands. With recognition of its importance and proper management, it helps to conserve natural capital by providing sustainable food and fiber production, clean water, habitat for wildlife, and more. In the broadest sense, working landscapes are mosaics of natural areas, managed lands, communities, and uses that are of socioeconomic importance.

The working landscapes of the upper American River watershed provide significant economic, environmental, and social value to local communities and statewide. Forests are the dominant landcover, particularly evergreen forests like those in the Eldorado and Tahoe National Forests. Shrubs and herbaceous plants are also present, both in developed areas near low-lying Sacramento County and within the burn areas where forests have experienced wildfires. Herbaceous plants can also include cultivated tree crops, such as those in Apple Hill. All these land covers provide important functions and value to the ecosystem and communities.

Watershed benefits are provided through EGS via working landscapes. EGS are the conditions and processes, through which natural ecosystems and the species living within, sustain and fulfill human life.

In general, ecosystem goods are tangible and quantifiable products derived from the natural environment, including resources such as water, timber, fish, and agricultural crops that directly support human livelihoods and well-being. Ecosystem services refer to the diverse range of ecological processes, functions, and benefits, including water purification, flood regulation, soil fertility, biodiversity support, and recreational opportunities, that directly and indirectly contribute to human welfare and the overall health of the watershed environment.

Natural capital assets such as farms, rangelands, forests, and meadows possess unique economic development value because they cannot be outsourced – they are intrinsic to the landscape. In recognizing the natural capital present among working landscapes, we can more equitably distribute the cost of watershed management, preservation, and enhancement across beneficiaries. In addition, built infrastructure and associated management structures are necessary to realize some of the EGS provided by the upper American River watershed. This includes the storage and conveyance for water supply and hydropower facilities and conveyance for energy production, as well as the transportation system, including those beyond the main roads, to allow the transfer of EGS.

The concepts of natural capital and working landscapes are foundational to the PWP because they help validate programmatic, collective investments by watershed partners for maintaining the long-term health of the watershed. EDWA is currently conducting study for quantifying potential values of the EGS provided by the upper American River watershed with anticipated preliminary results in late 2023/ early 2024.

2.3 Roles and Responsibilities in Watershed Management

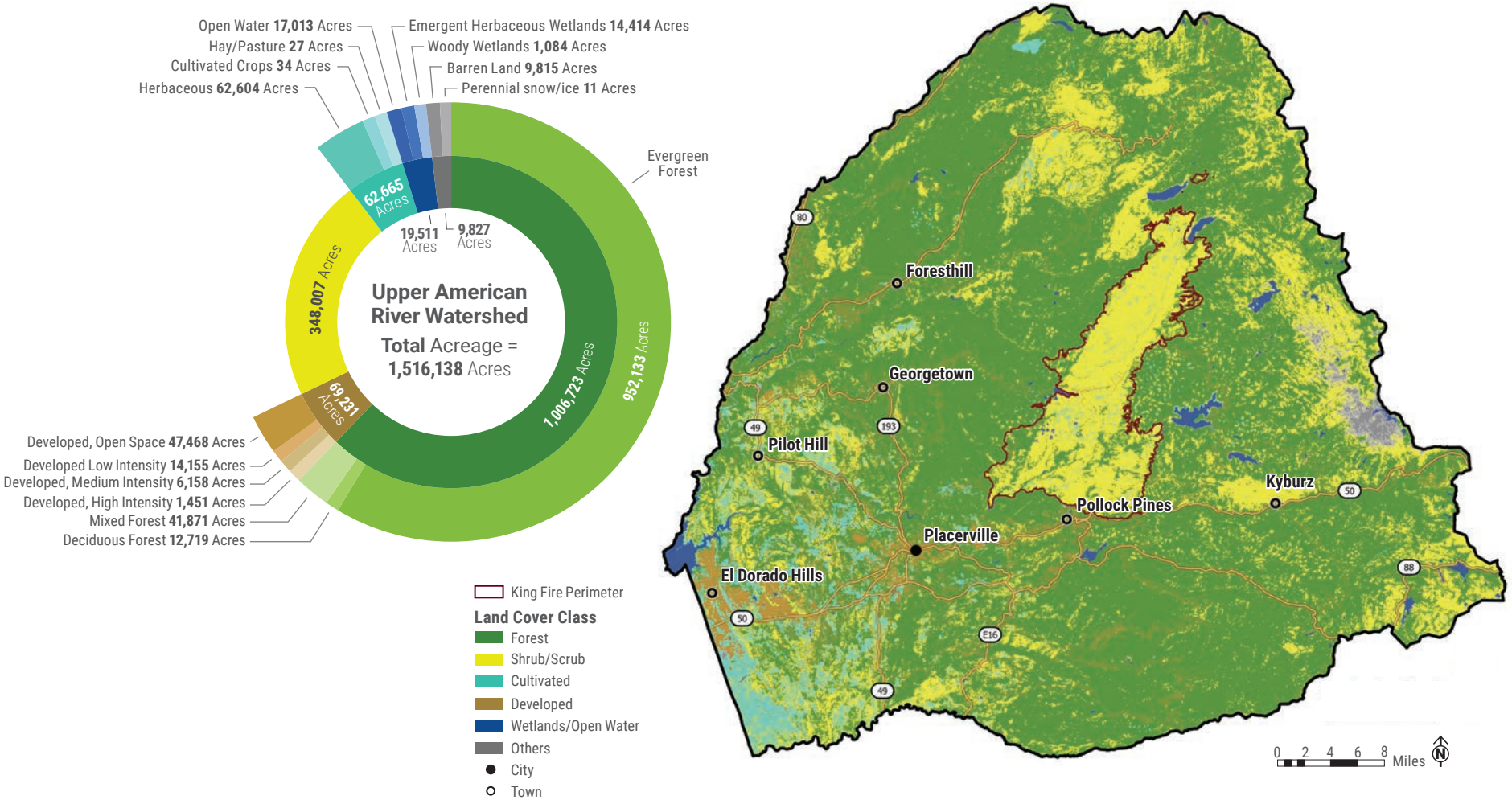
Numerous agencies and entities with varying authorities have their corresponding roles and responsibilities in managing the upper American River watershed. Some are resource-specific or geographically bound, and some have broad charges cross resources and substantial land areas. The montage of land ownership, differing management approaches, and gaps and overlaps in institutional responsibilities all add complexity to the principles of integrated, comprehensive watershed management. The following summarizes the general conditions of land ownership and management authority within the upper American River watershed.

Land Ownership

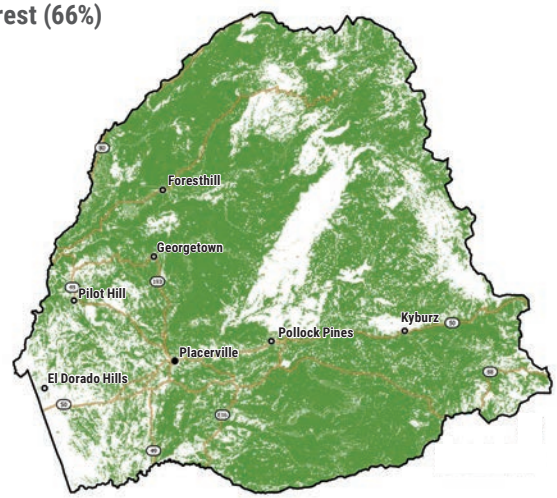
A majority of the upper American River watershed (about 54 percent) is federally owned land, which includes portions of the Eldorado and Tahoe National Forests, BLM lands for various management purposes including protection of rare plant species in the Pine Hill Preserve (see page 20 for more details), and tribal asset land holdings of the Shingle Springs Band of Miwok Indians. Consequently, federal entities play an indispensable role in maintaining the health and sustainability of much of the watershed. State of California's ownership and management is mostly in and near the Auburn State Recreation Area. The land within the Auburn State Recreation Area is mostly federally owned, acquired originally for the construction of the Auburn Dam and thus, called the Auburn Project Land. Currently, the Auburn Project Land is managed by the California Department of Parks and Recreation, which also owns the Pointed Rocks Ranch property obtained through donation by the Trust for Public Land in 2007. California Department of Fish and Wildlife also owns a few parcels with sensitive plant species in the Pine Hill Preserve.

Only about 28 percent of lands in the watershed are subject to management under county general plans. These lands are generally located on the west side of the upper American River watershed toward the low-lying Sacramento metropolitan areas. Rural residential lands are primarily comprised of forest land cover that often connects National Forest lands and private timber lands. The upper American River watershed has a long history of private timber harvesting (notably by Sierra Pacific Industries), although forest production has substantially reduced in recent decades due to changes in regulatory policies, increased production costs relative to other forest product markets, and decreased demand. Many private timber lands lie adjacent to the Eldorado and Tahoe National Forests. Other private lands in the upper American River watershed are mostly used for farming and ranching. Conservation land holdings by nongovernmental organizations, such as the American River Conservancy and Placer Land Trust, are also distributed throughout the watershed. Land conservations and land trusts play an important role in protecting the watershed's natural resources and promoting sustainable land use. American River Conservancy and Placer Land Trust collectively steward over 15,000 acres of fee-owned land and conservation easements in the upper American River and upper Cosumnes River watersheds. These land trusts play an important role in identifying and protecting lands that provide habitat connectivity and help achieve goals set forth for species protection and ecosystem protection in county general plans, endangered species recovery plans, state wildlife action plans, and the State's *Pathways to 30x30 Action Plan* developed in responding to Governor's Executive Order N-82-20 to evaluate the role of natural and working lands against climate change and advancing biodiversity conservation.

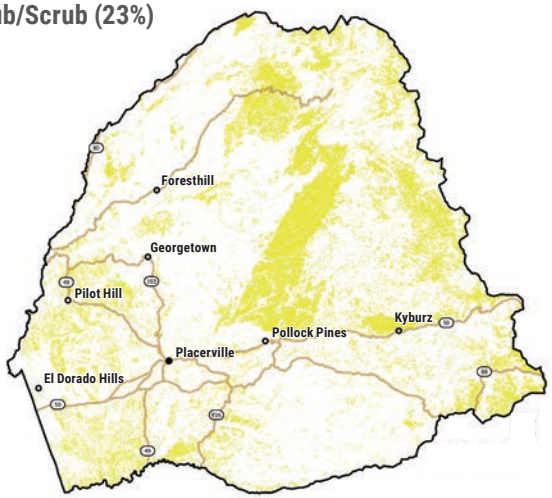
Forests, especially evergreen forests, are the most prominent land cover type in the upper American River watershed, covering more than 62 percent of the watershed. Forest management can be the most important component of managing the upper American River watershed. The resulting capacity of the watershed in providing EGS can be altered and damaged with major wildfire events as evidenced by the land coverage affected by 2014 King Fire.



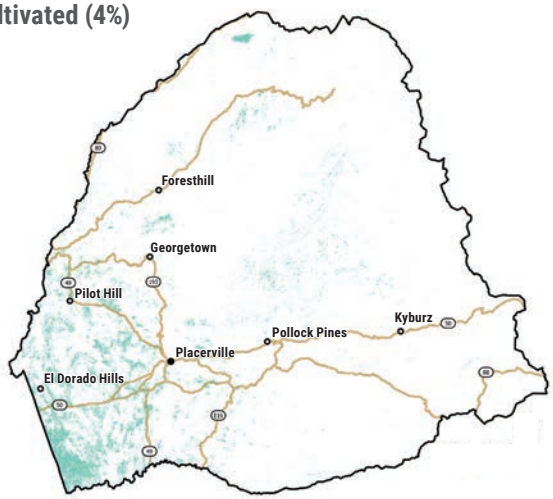
Forest (66%)



Shrub/Scrub (23%)



Cultivated (4%)

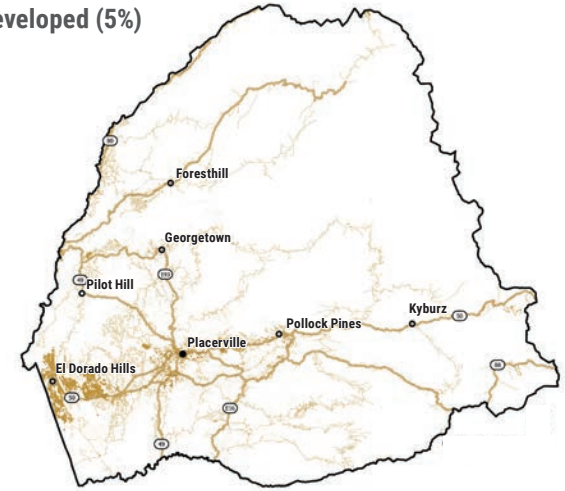


Land Cover Class

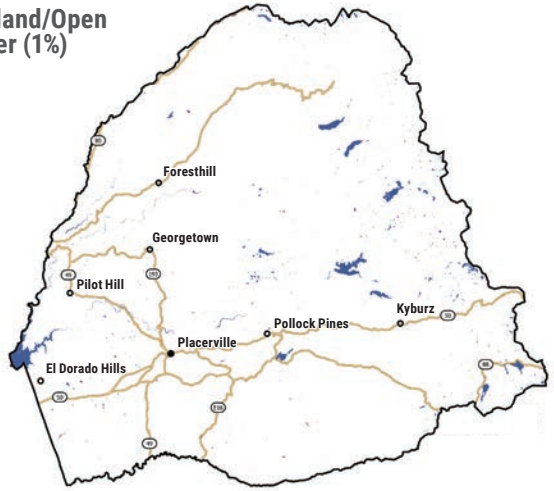
- Forest
- Shrub/Scrub
- Cultivated
- Developed
- Wetlands/Open Water
- Others
- City
- Town
- Highway/Major Road

0 2 4 6 8 Miles

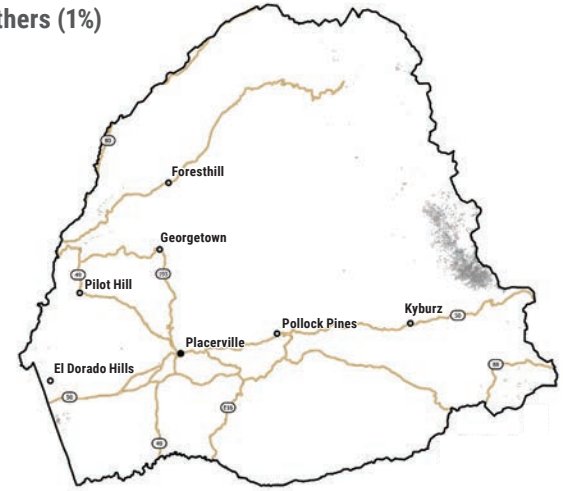
Developed (5%)



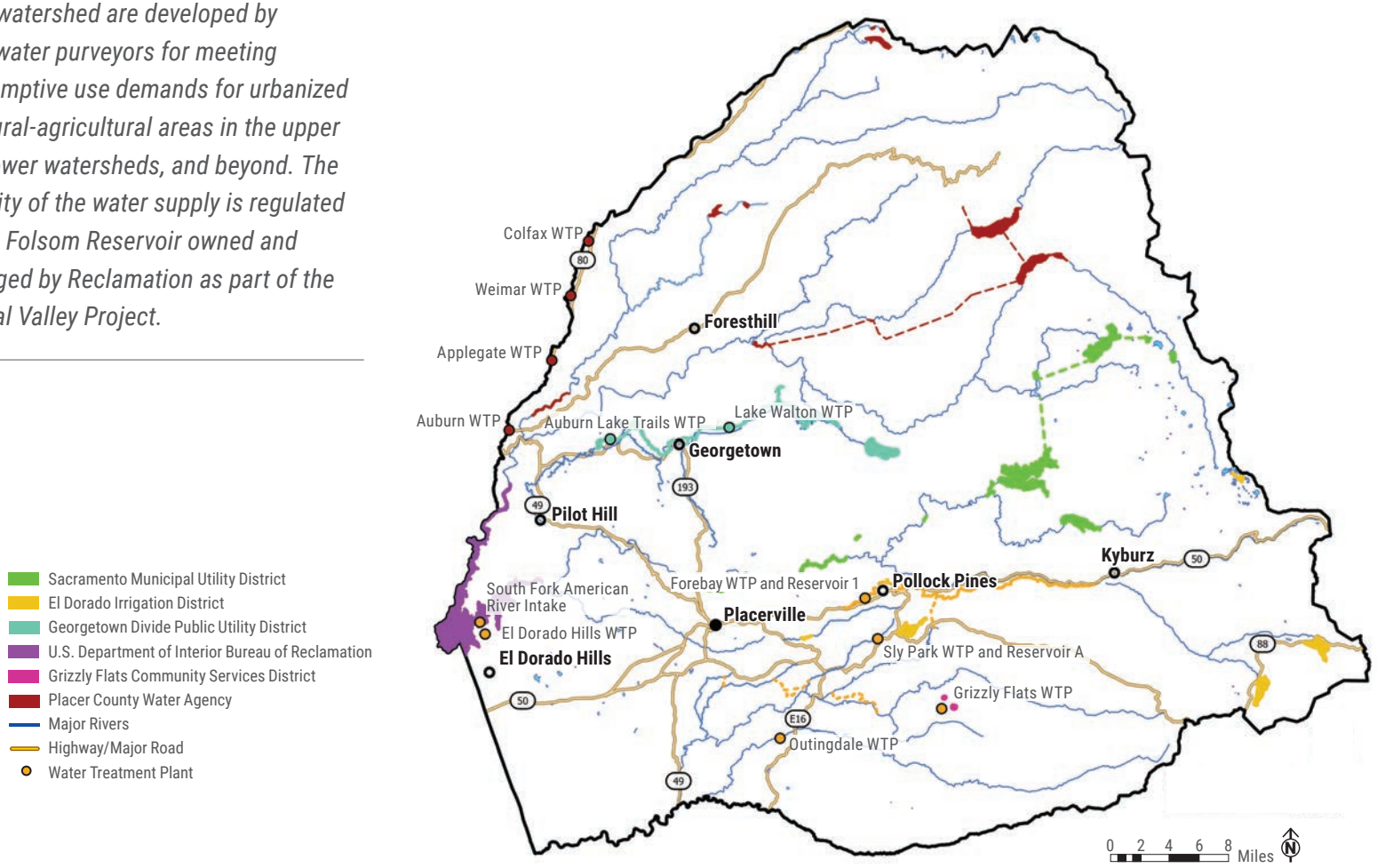
Wetland/Open Water (1%)



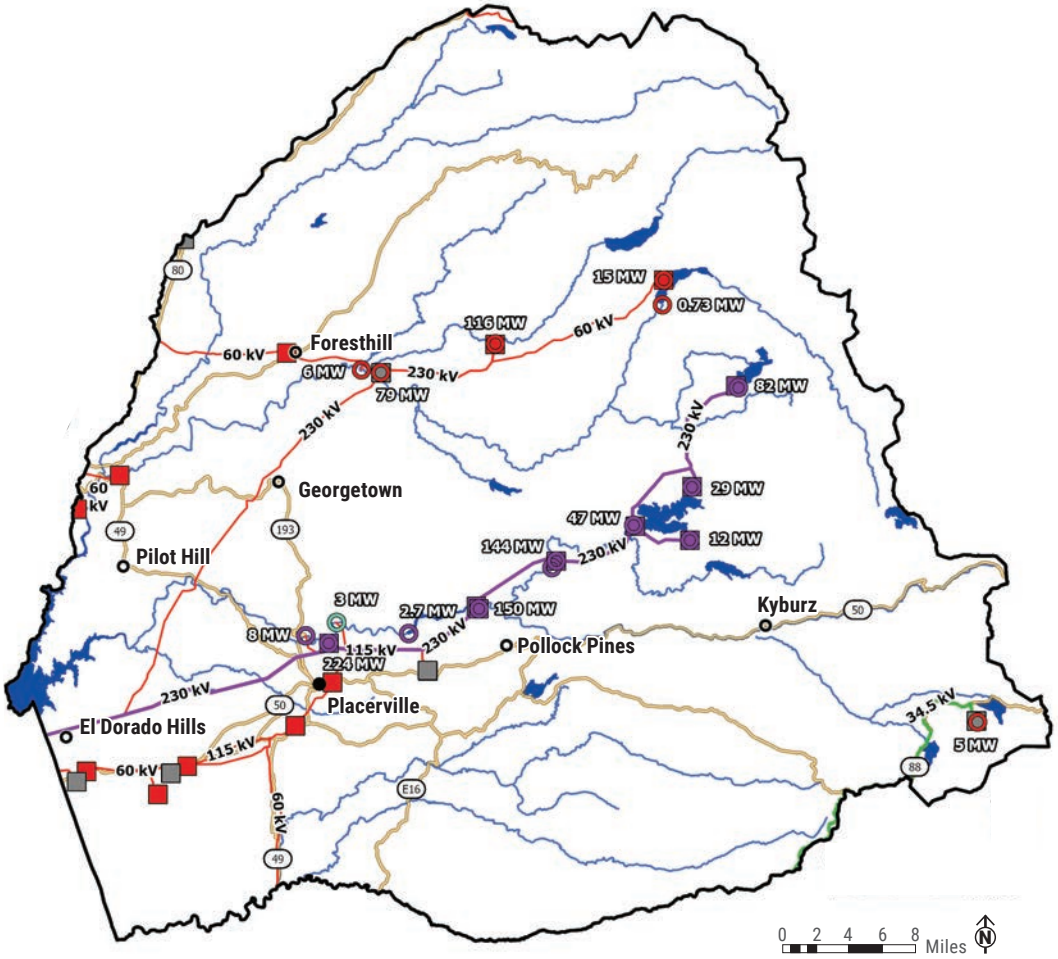
Others (1%)

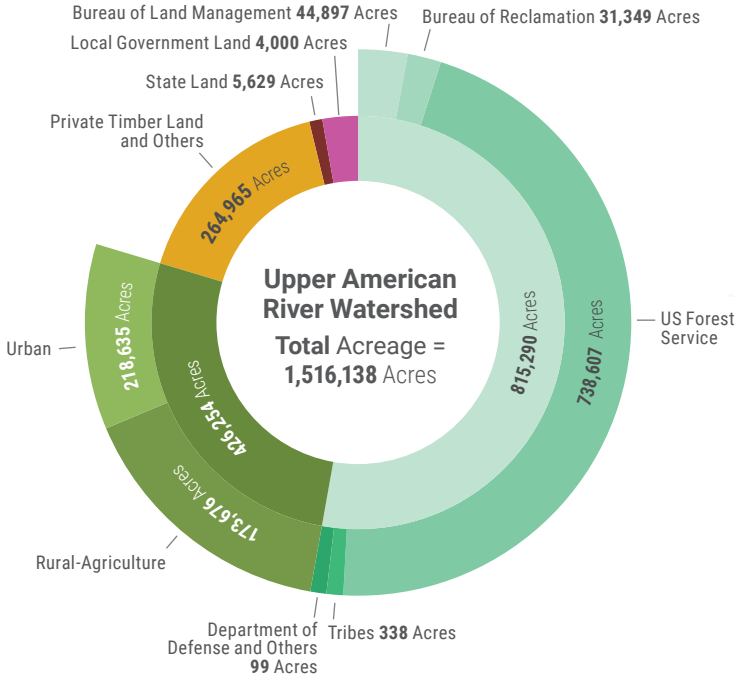


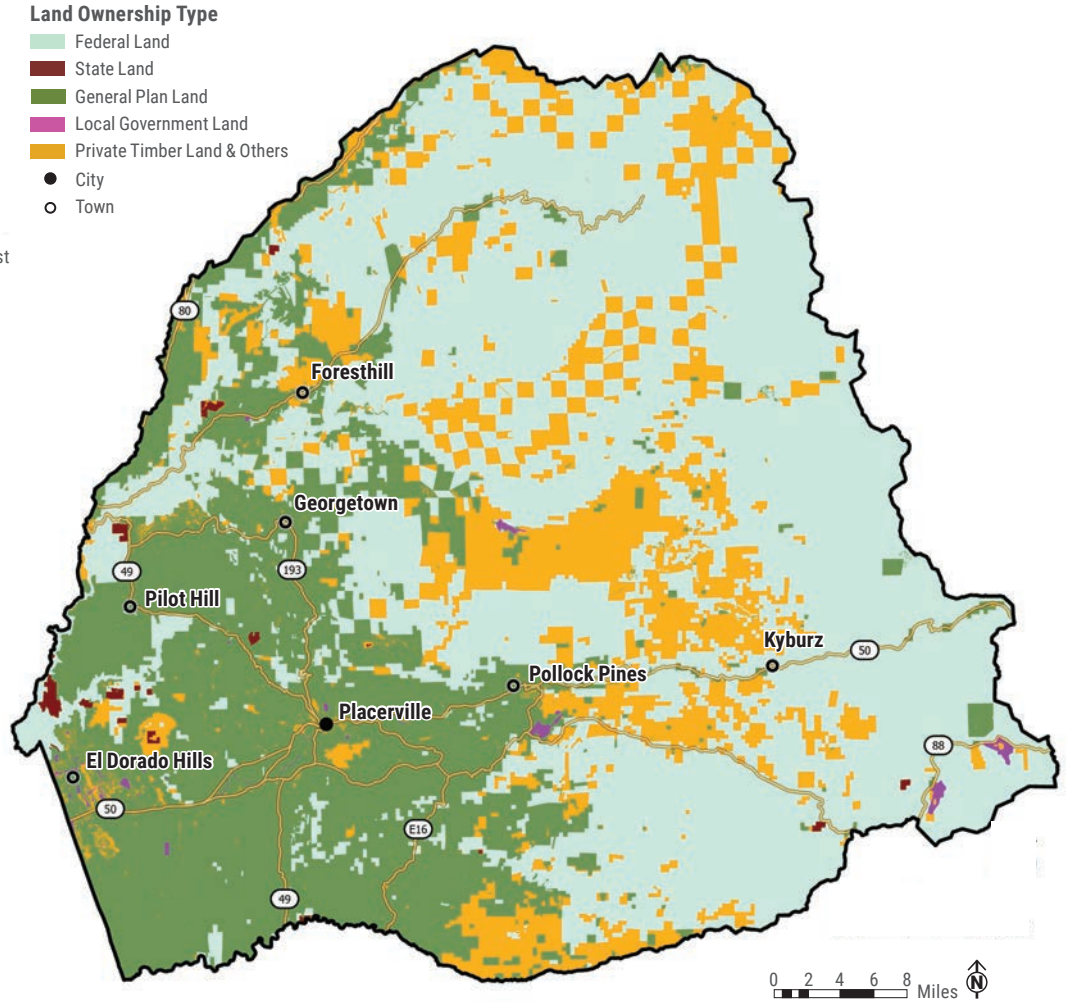
Water resources in the upper American River watershed are developed by local water purveyors for meeting consumptive use demands for urbanized and rural-agricultural areas in the upper and lower watersheds, and beyond. The majority of the water supply is regulated by the Folsom Reservoir owned and managed by Reclamation as part of the Central Valley Project.



Hydropower generation is an important renewable energy source that is often generated in headwaters, far from where the electricity is used. Therefore, it is important to consider community benefit sharing from energy utilities in modern watershed planning.

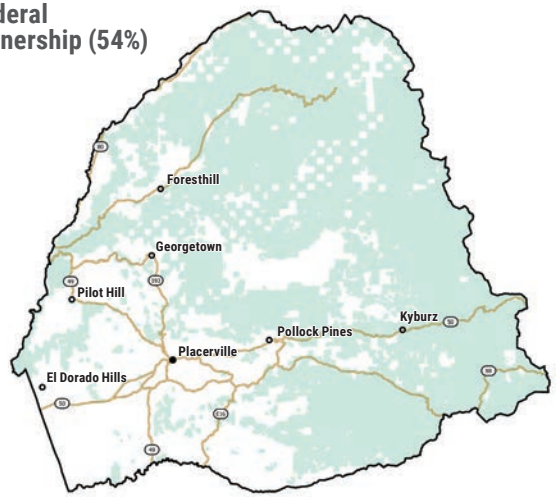




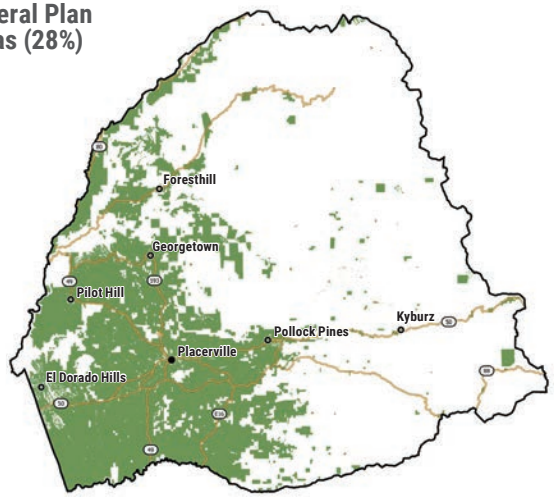


Over half of the upper American River watershed is federally owned land. The watershed has a long history of private timber harvesting, although forest production has substantially reduced in recent decades due to various reasons.

Federal Ownership (54%)



General Plan Areas (28%)



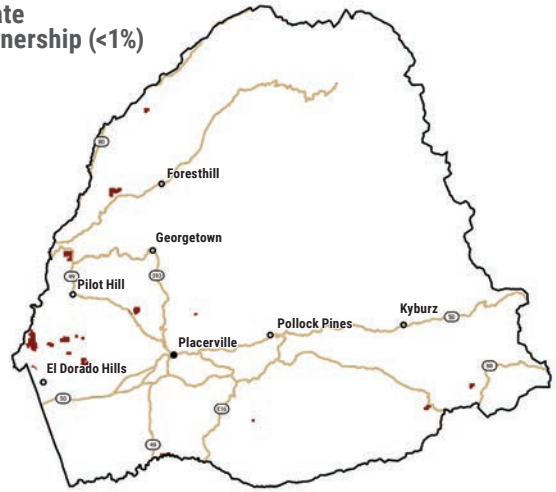
Land ownership in the upper American River watershed is uniquely diverse. As such, a systematic watershed approach requires coordination and collaboration with all landowners in the watershed.

Land Cover Class

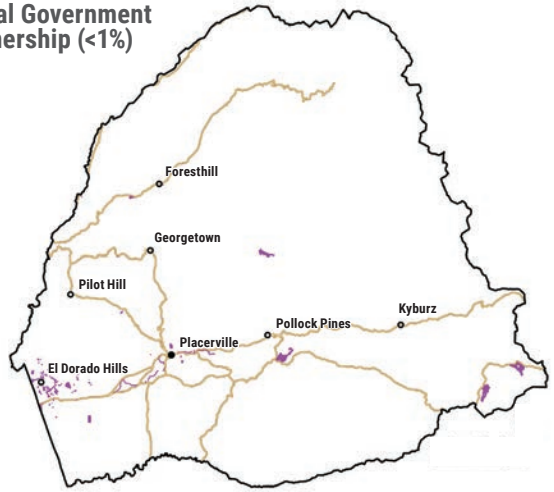
- Federal Land
- General Plan Land
- Private Timber Lands & Other
- State Land
- Local Government Land
- City
- Town
- Highway/Major Road

0 2 4 6 8 Miles

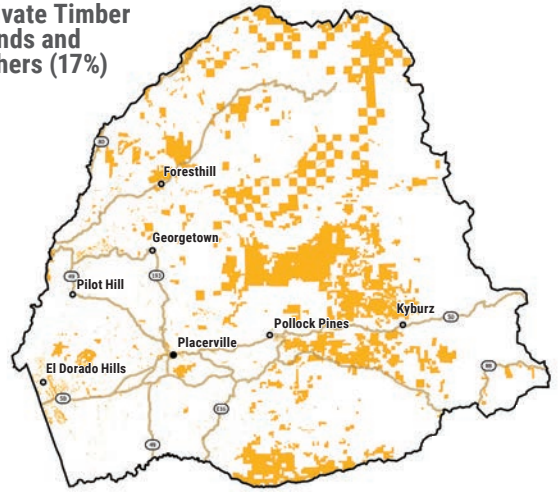
State Ownership (<1%)



Local Government Ownership (<1%)



Private Timber Lands and Others (17%)



Management and Stewardship

Impacted by extensive droughts and wide-spread insect infestation, the heavily forested areas within the upper American River watershed pose significant wildfire hazards. The generally steep terrains in the watershed are not easily accessible for wildfire suppression purposes, contributing additional management and hazard mitigation challenges.

A combination of federal, state, county, and private entities share management and stewardship responsibilities in the upper American River watershed. Given their large land holdings, federal entities including the USFS and BLM play an important role in managing the health and sustainability of much of the watershed. Private entities like Sierra Pacific Industries also own significant timber lands in the watershed and provide forest management and stewardship functions. During the Gold Rush era, timber harvests in the upper American River watershed provided forest products for growth in the Sacramento region and had a strong influence on forest structure and health. Modern timber operations in the watershed differ from those used historically due to changes in laws and regulations, shifts in regional and global forest product markets, and other factors. The watershed's timber harvesting operations are also subject to supervision by the California Department of Forestry and Fire Protection (CAL FIRE). CAL FIRE's management activities focus on fire prevention and protection and emergency response.

Both the EDC and County of Placer (PC) play important roles within the watershed. EDC and PC General Plans provide policies and guidance for development within unincorporated areas of the counties. These plans are used by the local governments to address, balance, and integrate the interests and needs of their residents.

Various elements of the General Plans have ties to watershed management including, but are not limited to, land use, habitat conservation and open space, and agriculture and forestry elements. For example, EDC's General Plan identifies corridors for species protection (General Plan, Objective 7.4.2: Identify and Protect Resources) and areas of prioritized oak woodland protection (General Plan Policy 7.4.4.4). EDC has a memorandum of understanding with EDWA to support water-related planning efforts, consistent with EDWA's authority. Similarly, within Placer County, PC and PCWA work together on watershed management with collaboration with other agencies and entities.

Water and energy utilities such as PCWA, El Dorado Irrigation District (EID), Sacramento Municipal Utility District (SMUD) have facilities and business interests in the upper American River watershed. These utilities rely on the water resources provided by the watershed and serve as important stewards and advocates for sustainable management and watershed health. Currently, Pacific Gas and Electric Company (PG&E) has only transmission lines in the watershed.

El Dorado Resource Conservation District (RCD), Georgetown Divide RCD, and Placer RCD play critical roles implementing watershed management projects in collaboration with other local entities. For example, EDC and the El Dorado RCD recently established a pilot Emergency Forest Restoration Team in El Dorado County to provide timely assistance to non-industrial, private forests as directed by the Governor's 2021 *California's Wildfire and Forest Resilience Action Plan.*

Counties also provide many services that are closely related to community resilience, including fire, health, and other critical services. Senate Bill (SB) 552 of 2019 directs counties to improve drought resilience planning and water shortage mitigation for state small water systems and domestic wells, which could be especially vulnerable during droughts and other water shortage events (e.g., power outages, high sediment loading from severe burn areas after heavy storms).

Under California Government Code Section 8605, each county is designated as an operational area under the California Emergency Services Act. An operational area is an intermediate level of the state emergency services organization, consisting of a county and all political subdivisions within the county area, such as cities, special districts, and water agencies. Thus, during emergencies and disaster recovery efforts, counties are the local lead working with the Federal Emergency Management Agency (FEMA) and California Governor's Office of Emergency Services for assistance. As wildfires, high-intensity storms (e.g., atmospheric rivers or hurricanes), and other emergencies become more frequent, counties play an increasingly critical leadership role in watershed planning and management.

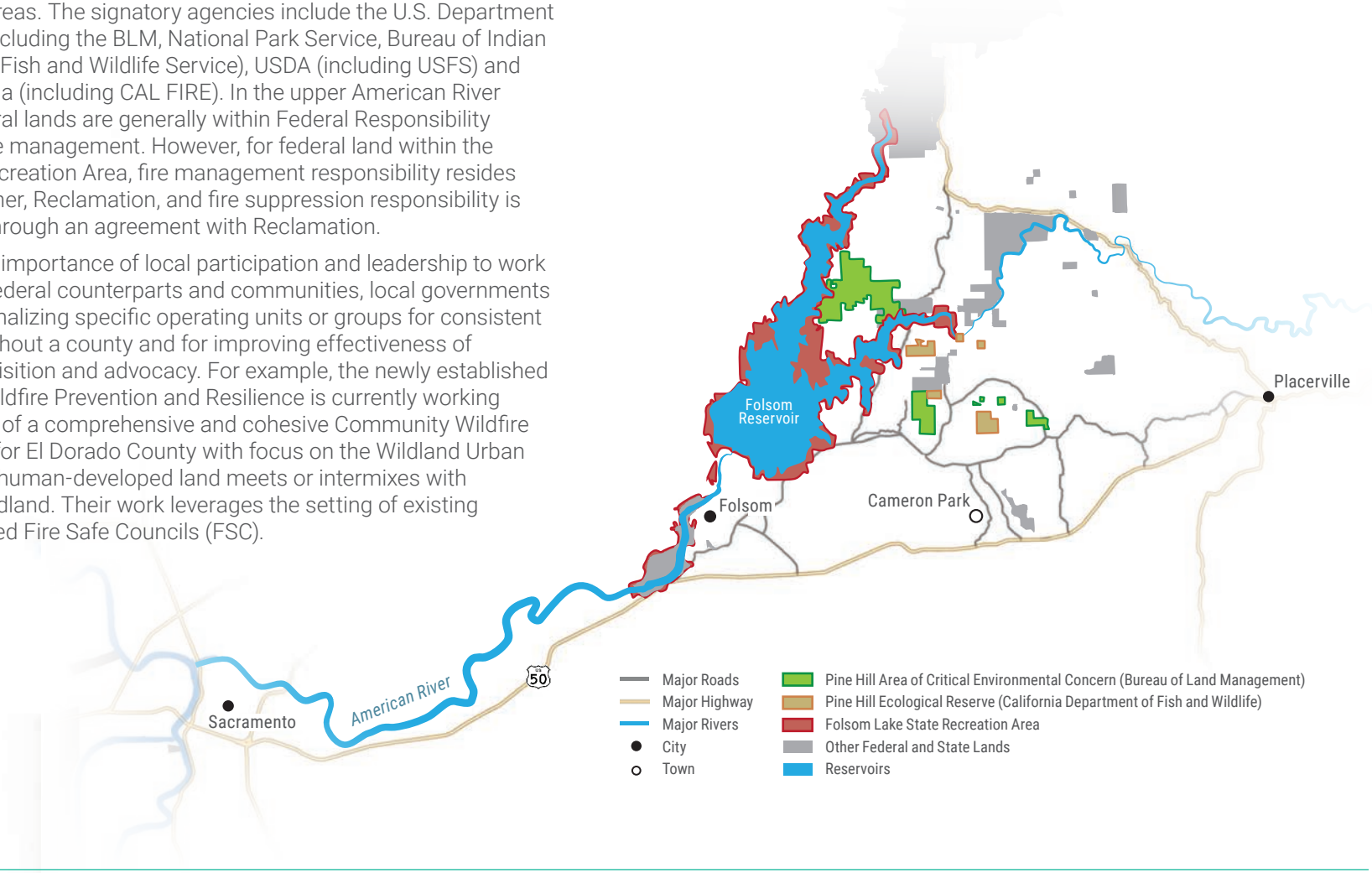
Wildfire Prevention and Recovery

A historical transition toward unnaturally dense forests and a century of fire suppression and climate change resulting in warmer, hotter, and drier conditions, have left the majority of California's forestland highly vulnerable to catastrophic wildfire. Wildfire prevention and recovery actions from major wildfires are critical for preserving and restoring EGS in the watershed. Comprehensive restoration of areas affected by wildfire, such as the Caldor Fire of 2021, can be challenging given the complex mix of federal, private, and conservation ownership, and the need to coordinate jurisdictions, actions, and funding programs.

The administrative responsibilities for wildland fire protection and management fall under applicable state and federal laws. Local, State, and Federal Responsibility Areas are defined in the 2007 *California Master Cooperative Wildland Fire Management and Stafford Act Response Agreement.* This agreement underlines the commitment of agencies to improve efficiency by facilitating the coordination and exchange of personnel, equipment, supplies, services, and funds for wildland fires and non-wildland emergencies or disasters that are Presidentially declared emergencies or disasters. The 2007 agreement also delineates distinct responsibility areas for fire protection and management among federal and State agencies – namely, Federal Responsibility Areas and State Responsibility Areas. The signatory agencies include the U.S. Department of the Interior (including the BLM, National Park Service, Bureau of Indian Affairs, and U.S. Fish and Wildlife Service), USDA (including USFS) and State of California (including CAL FIRE). In the upper American River watershed, federal lands are generally within Federal Responsibility Areas for wildfire management. However, for federal land within the Auburn State Recreation Area, fire management responsibility resides with the landowner, Reclamation, and fire suppression responsibility is with CAL FIRE through an agreement with Reclamation.

Recognizing the importance of local participation and leadership to work with State and federal counterparts and communities, local governments also started formalizing specific operating units or groups for consistent practices throughout a county and for improving effectiveness of assistance acquisition and advocacy. For example, the newly established EDC Office of Wildfire Prevention and Resilience is currently working on development of a comprehensive and cohesive Community Wildfire Protection Plan for El Dorado County with focus on the Wildland Urban Interface where human-developed land meets or intermixes with undeveloped wildland. Their work leverages the setting of existing community-based Fire Safe Councils (FSC).

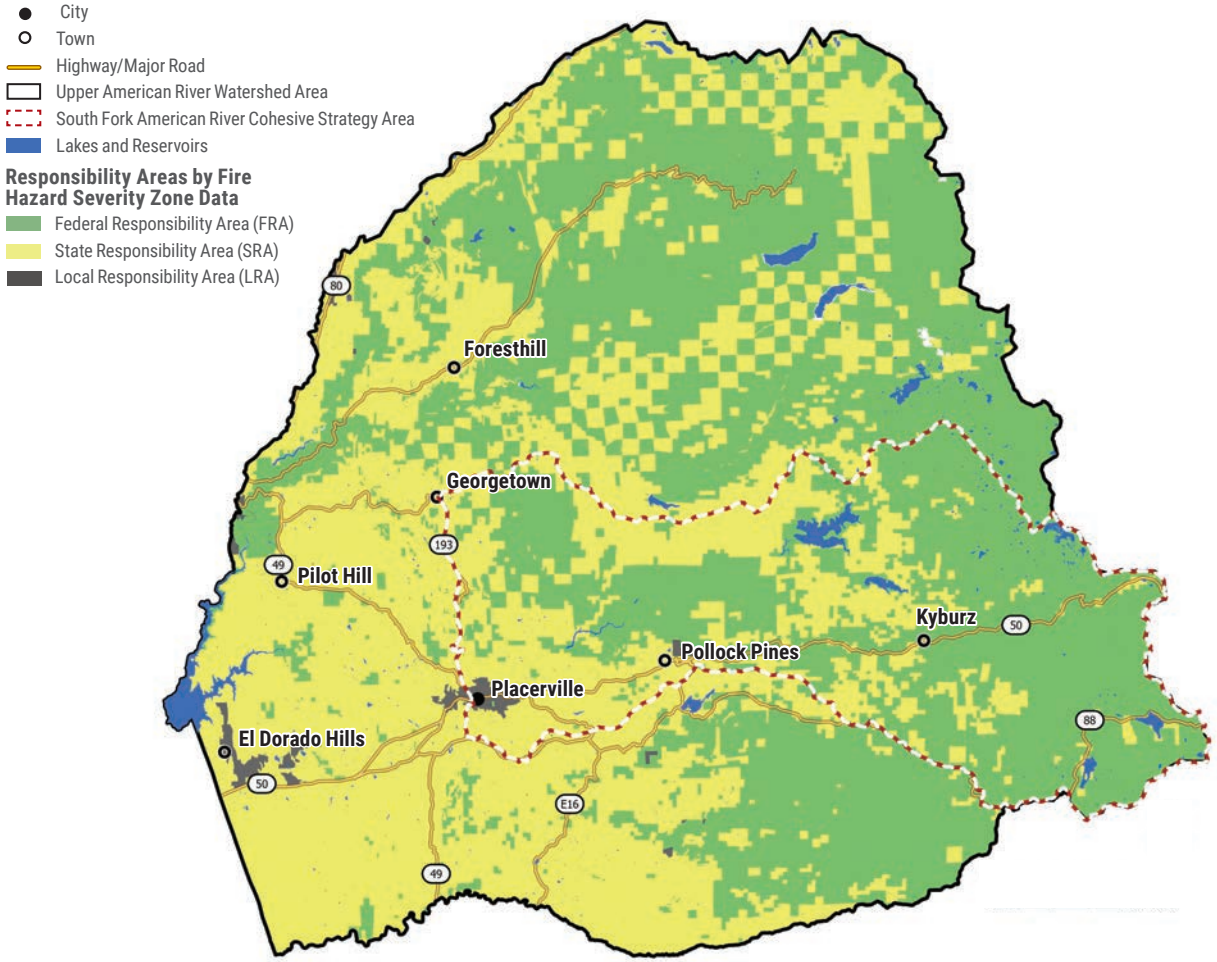
The 4,940-acre Pine Hill Preserve is a perfect example of a collaborative conservation effort among federal, state, and local entities. The preserve includes the habitat of eight rare plant species covering about 70% of the preserve lands, with about 10% of the California native flora represented.



FSC are grassroots community-based organizations in California that share the objective of making communities less vulnerable to catastrophic wildfire. They exist throughout communities in the Wildland Urban Interface as defined by CAL FIRE. The concept of FSC was initiated in 1968 and has evolved through time with support from the State and federal governments. FSC are an integral part of the fire management structure in California. Their primary purpose is to educate and inform property owners and residents of their fire management responsibilities and promote cooperation and actions to actively reduce wildfire risks in their communities.

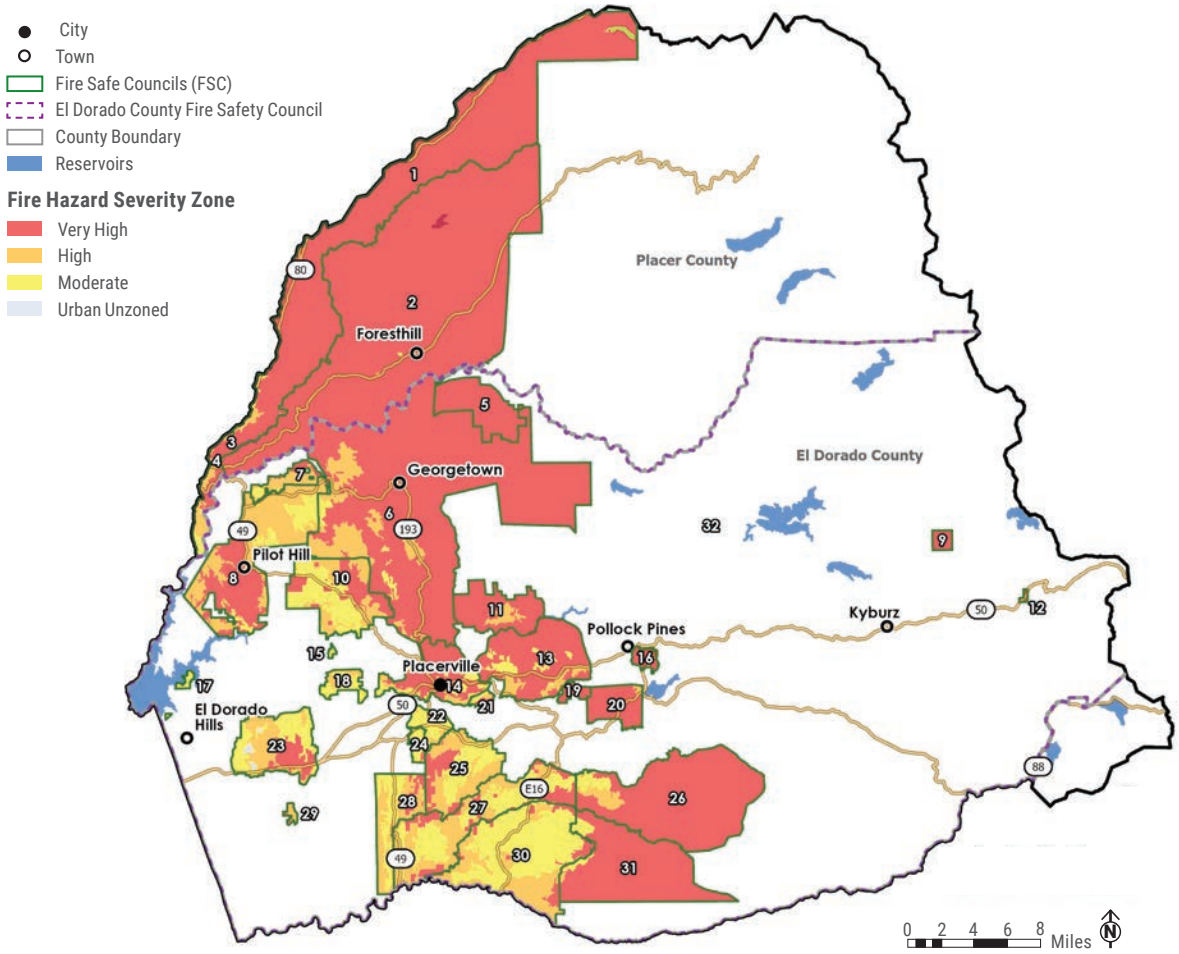
In the El Dorado County portion of the upper American River watershed, the El Dorado County FSC covers the entire county, with 29 associated FSC in the West Slope. In Placer County, there are three FSC with territory in the upper American River watershed. To coordinate their efforts, Placer County also convenes a Fire Safe Alliance with all relevant partners, including CAL FIRE and FSC. A similar but more grassroots organization in El Dorado County is the South Fork American River Cohesive Strategy, which has a focused area that covers only a portion of the upper American River watershed. The expansion of like functions throughout the EDC and watershed would be a valuable contribution to the communities. To that end, EDC updated the County Strategic Plan in 2022 to support the creation and maintenance of fire-adapted, resilient communities through a countywide wildfire protection strategy. The EDC Office of Wildfire Preparedness and Resilience was established to lead this effort and coordinate the planning and implementation of wildfire mitigation activities across jurisdictions and land ownerships in collaboration with the El Dorado County FSC.

The Fire Hazard Severity Zone is a classification system used by the California Department of Forestry and Fire Protection to assess the risk of wildfire in California. The Federal, State, and Local Responsibility Areas are the areas of California where the federal government, state, and local government, respectively, have financial responsibilities for wildfire protection and prevention. The grassroots group organized per USFS Cohesive Strategy, South Fork American River Cohesive Strategy, covers only a portion of the watershed.



Fire Safe Councils are an integral part of the fire management structure in California. Their primary purpose is to educate and inform property owners and residents of their fire management responsibilities and promote cooperation to actively reduce wildfire risks in their communities.

Label	Name
1	Placer Sierra FSC
2	Forest Hill FSC
3	Georgetown FSC
4	Volcanoville FSC
5	Greater Auburn Area FSC
6	North Auburn/Ophir Council FSC
7	Auburn Lake Trails FSC
8	Cool-Pilot Hill FSC
9	Wrights FSC
10	Coloma-Lotus FSC
11	Mosquito FSC
12	Strawberry FSC
13	Camino FSC
14	Placerville FSC
15	Gold Hill Estates FSC
16	Gold Ridge Forest FSC
17	Lakehills FSC
18	Greenstone FSC
19	Rancho Del Sol FSC
20	Sierra Springs Regional FSC
21	Texas Hill FSC
22	Diamond Springs FSC
23	Greater Cameron Ranch FSC
24	Patterson Ranch FSC
25	Oak Hill FSC
26	Grizzly Flats FSC
27	Sandridge FSC
28	Logtown FSC
29	Royal Equestrian FSC
30	Aukum Fairplay FSC
31	Omo Ranch FSC
32	El Dorado County FSC



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Challenges Ahead

This chapter describes the major management challenges of the upper American River watershed from the lens of watershed management. This chapter describes key challenges of resource management in the upper American River watershed related to long-term economic, environmental, social, and cultural sustainability. The effects of economic development and climate change continue to manifest throughout all aspects of resource management and community life in the watershed. To identify these complex, interrelated challenges and stressors on a landscape scale, the watershed – as well as the communities, ecosystems, and cultures within – was viewed through the lenses of its natural, built, and social capacities:

Natural capacity reflects the ability of a watershed to produce EGS (see Chapter 2.1). It includes renewable (e.g., forests, water) and non-renewable (e.g., minerals) resources and associated products (e.g., hydropower). Threats to natural capacity can be natural, man-made, or a combination of both, and may include increasing temperatures that impact native habitat, urban development, or invasive species.

Built capacity reflects the physical infrastructure in the watershed, such as buildings, roads, power lines and water distribution facilities. Built infrastructure provides important services directly to communities, like power and water, and also enables development and export of the watershed's environmental goods and services. Threats to built capacity may include floods or wildfire driven by climate change, earthquakes, or funding for facility maintenance.

Social capacity reflects the "people" resources of the watershed. This includes governmental and social institutions, businesses, workforce, organizations, and the knowledge and skills of the people within the watershed. For example, a threat to social capacity may include economic downturns affecting businesses as well as funding for schools/education and important social programs, or a lack of organizational mechanisms for change. A lack of trust to established governmental and social institutions can be also a significant threat to social capacity.

The term "capacity" in this context also encompasses the ability to provide intended functions, adapt to changing conditions and recover quickly from damage or stress; for example, the extent to which a power system can withstand and recover from a fire, or an ecosystem can withstand long-term temperature increases due to climate change. The consideration of these capacity levels highlights the importance of addressing compounded challenges with an integrated watershed approach that encompasses land use, resource management, and economic development.

Seven major watershed challenges for managing the natural, built, and social capacities of the upper American River watershed in a holistic way to properly address the inherent interconnectedness and mutual influence of these attributes were identified through collaboration and discussion among the partners, and supplemented with challenges identified in prior studies and planning efforts. These are summarized in the next two pages along with their relative level of concern to the watershed, and their integrated nature is explored in the sections that follow.

Watershed Management Challenges

Natural Capacity

Lack of a cohesive watershed vision, policy, and implementation

- The complex structure of numerous entities with varying watershed management roles and responsibilities in the upper American River watershed creates barriers for effective integrated watershed planning and management.
- Reactive policies and funding availability from State and federal assistance programs often focus on short-term accomplishments or responses, hindering long-term improvements to the natural, built, and social capacities of the watershed.
- Lack of equitable cost-sharing and sustainable funding mechanisms with recognition of the value of natural capital and associated EGS provided by the watershed.
- Insufficient data and information available for watershed and resource-specific conditions to inform science-based and result-oriented planning and implementation.

Rapid loss of ecosystem functions and quality

- Urban development, droughts, insect infestations, and inadequate forest management caused rapid loss of EGS in recent decades.
- Recent major wildfires disrupted the ecosystem, damaged habitats and communities, and created landscape-level changes in available nature capital and associated capacity for providing EGS. Sediments and debris from the burned areas further degraded lakes and streams, channels and habitats.
- Invasive species created damage to forests, rangeland and water body structures, and increased wildfire risk.
- Pests and disease caused vegetation deadfall and overgrowth on different occasions, clogging waterways, and damaging wildlife habitats, creating significant impacts on overall ecosystem health.

Emerging threats to native species and protected plants

- The pressure of urbanization into areas reserved for rural-agricultural designation in county general plans is increasing under the housing shortage and the desire for improved quality of life.
- The increased demands for outdoor recreation after COVID-19 pandemic created elevated concerns over water quality impacts, soil erosion, damage to fragile meadows, habitats, and other sensitive areas, invasion of noxious weeds, and increase in wildfire risks.

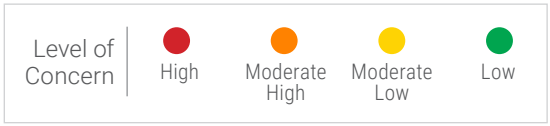
Built Capacity

Diminishing ability in regulating hydrology and disposal of biomass

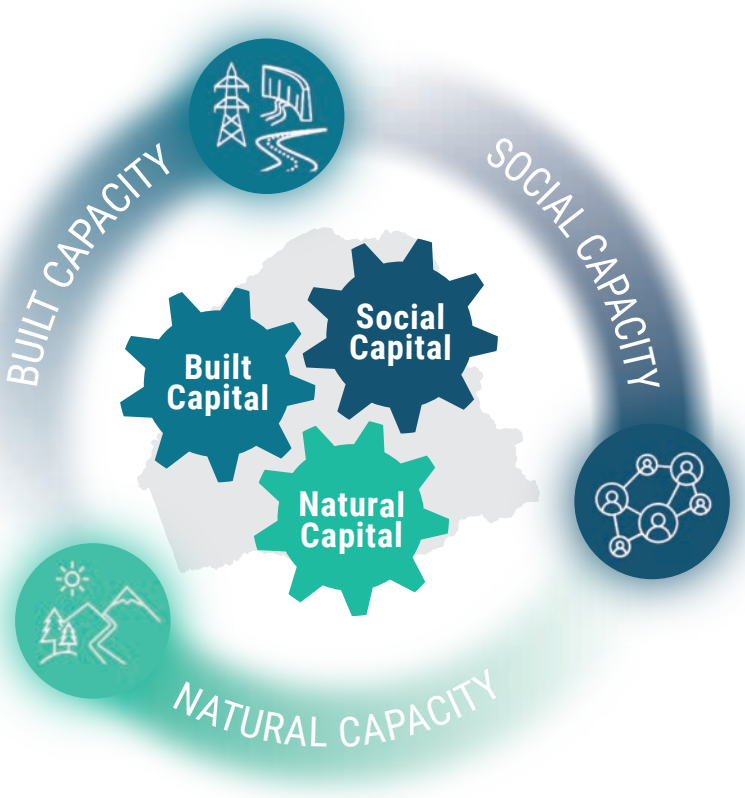
- The total capacity of lakes and reservoirs is insufficient to offset the anticipated loss of snowpack with climate change for adequate and reliable water supply, or attenuate flood flows resulting from increase in storm intensity.
- There is a lack of local and regional capacity to transform the large volume of biomass (trees and woody products) in the watershed into new and beneficial resources. The capacity of existing water, energy, transportation, and broadband infrastructure cannot support the desired rural-agricultural way of life or proper response to / recovery from emergencies.

Increased vulnerability of aging infrastructure

- Aging unlined ditches and wooden water conveyance structures are susceptible to damage by wildfires, landslides, and other hazards.
- Increase in precipitation intensity during storms overwhelms dated designed stormwater systems, causing major localized flooding and property damage.
- Landslides, sediments and debris after wildfires could impact water the ability of water suppliers to provide reliable drinking water with adequate quality.
- Wells in the fractured rock formation prevalent in the watershed are not reliable during droughts with increasing frequency and intensity.
- Increase in dam safety concerns because atmospheric river events became more frequent and intensified



Watershed Management Challenges			
Social Capacity			Water Resource-Related Challenges
Limited public understanding and trust for cooperation	**Lack of skilled workforce for adaptation needs**	**Disconnected local economy for community resilience**	
• Limited public understanding about the value of watershed, including the associated EGS, hinders the opportunities for developing a holistic approach for watershed management, and equitable cost sharing strategy. • Ineffective engagement to influence federal and State policies and implementation preferences for advancing local improvement needs with recognition of local unique conditions and limitations. • Demographic changes resulting in lack of understanding about the risks and needed actions for wildfire resilience and protections against other hazards in rural-agricultural environment. • Lack of efficient and effective means of data sharing and information dissemination to improve transparency, reduce misinformation, and foster trust relationship.	• The local skilled workforce for needed watershed and forest management are lacking due to past decades of passive management practices and diminishing timber industry in general in the upper American River watershed. • The demographic changes and social preference render shortage of the local workforce for ongoing water and related resource management and facility maintenance. • The economic development and affordability are not conducive to recruit skill workers and necessary labor force to supplement the local workforce. • Academic programs and vocational educations are not sufficient to develop the next generation workforce for watershed management.	• Misalignment between community development with the workforce needed for watershed health, facility maintenance, and capacity building. • Lack of sufficient outlets and local businesses for wood product utilization from nearby forests to facilitate additional means of biomass disposal that benefit local economy with local resourcing. • Insufficient coordination among development efforts for transportation, communication, water and other major infrastructure to facilitate timely and effective development of working landscape, especially agricultural development, for improving community resilience and preserving preferred rural-agricultural way of life.	These include water supply, water quality, and public safety challenges, all of which primarily address the built environment. While some are not at the landscape scale of this PWP, they are highly connected to the challenges above and to the EGS that the watershed provides. These water resource-related challenges are considered a subset of the broad challenges listed above, and include the following: ● Long-term water supply demand imbalance ● Vulnerability during drought ● Loss of water supply due to other resource management practices ● Long-term water quality impacts due to wildfires ● Water quality impacts due to stormwater runoff ● Limited groundwater resources ● Vulnerability to flooding



Capacities are the outcomes of individual and collective actions and investments and their mutual influence. Through thoughtful and cohesive planning, and adaptive and reinforcing implementation, watershed-wise benefits and opportunities can be achieved without compromising individual actions.

3.1 Varying Mindsets Limit Capacity Building

Through existing processes and procedures, many agencies have made progress in addressing challenges posted by recent disasters and emergencies, population growth, regulatory changes, and other stressors including climate change. Success in agency-specific and local projects is necessary and encouraged, as well as celebrated. However, without applying a lens that is inclusive and of a landscape scale, the challenges experienced in the watershed in its totality can be masked and more sustainable and equitable solutions missed by successful but uncoordinated agency-specific or localized projects and implementation.

A proactive attitude and mindset are required in examining self-efficacy, locus of control, capabilities, motivation, and level of resilience. Individual entities or communities cannot, however, be sustained without the broader health and resilience of its surrounding watershed, the viability of communities, and policies of State and federal governments on watershed management that could dictate overall investment focus on resource management. For example, changes in demographic and economic conditions within the watershed also imposed a significant shortage of skilled labor force for existing work and emerging new and different tasks for built infrastructure and watershed management. The occurrences of different emergencies overlapped and created compound impacts to environment and communities (see Chapter 1.1). Inundated by emergencies, the communities and local governments were overwhelmed, and the local economy suffers accordingly. The frequent occurrences of emergencies also overwhelmed the State and federal assistance programs and available resources.

The available natural, built, and social capitals, as well as their corresponding capacity, need to be properly incorporated in long-term sustainable and equitable watershed planning and management. In this context, capital means the physical and non-physical (e.g., institutional and trust) assets and resources; capacity means the ability to leverage available and accessible capital to create individual and watershed-wide benefits.

The approach to establishing a shared vision for watershed management, where all agencies, entities and communities can thrive together, has gained more attention in recent years due to the needs to improve climate resilience to reduce the occurrence and impacts of preventable emergencies and major disasters. Particularly, failing to recognize the important connection between sustainable watershed management and community economic wellbeing can be a fatal flaw in watershed planning. The approach was also promoted by various thought leaderships and proactive agencies (e.g., SNC); however, the significant scope and scale of the challenges and potential solutions are not easy to formulate or comprehend, and often beyond one's authority and areas of responsibility.

The experience of COVID-19 pandemic in recent years is a good example to realize the need to recognize the scale of the matter at hand. The pandemic was a good testimony to how individual actions and fate cannot be comprehended without a larger, if not worldwide, framing. Likewise, the scale of climate change is global; however, the impacts of climate change are reflected locally and regionally. Flood is localized and regional; however, the beneficiary of flood benefits from water regulations from the upper American River watershed is mostly downstream in the low-lying Sacramento metropolitan areas. California water supply is local, regional, and statewide, and arguably interstate if water supplies from the Klamath River and Colorado River basins are taken into consideration. Headwaters like the upper American River watershed produce water supplies to millions in California and agricultural productions that feed the nation.

Outdoor recreation opportunities in the upper American River watershed are significant; visitors who may fuel the local economic engine could be from nearby regions, the rest of California, nationally, or even worldwide. Outdoor recreation is a local asset that cannot be outsourced, and in recent years, it has been recognized by researchers and many states, including New Mexico, Colorado, Wyoming, and Montana, to be the most effective for sustaining rural economy that warrants efforts in developing coalition for advocacy and potential institutional arrangements for investment since typically, outdoor recreation is enjoyed by all for free or with minimum fees that are insignificant compared with the costs for maintenance and management.

Wildfire protection and prevention are local/regional and regional matters but relies on statewide resources and management as well as federal cooperation and collaboration. In addition to defensible spaces and other preventive measures, the amendments of policy plans such as county general plans to include requirements for fire-retarding construction materials and adequate egress for at-risk communities are important steps for building fire-resilient communities. This requires an integrated planning with construction industry, transportation authorities, and regional development entities.

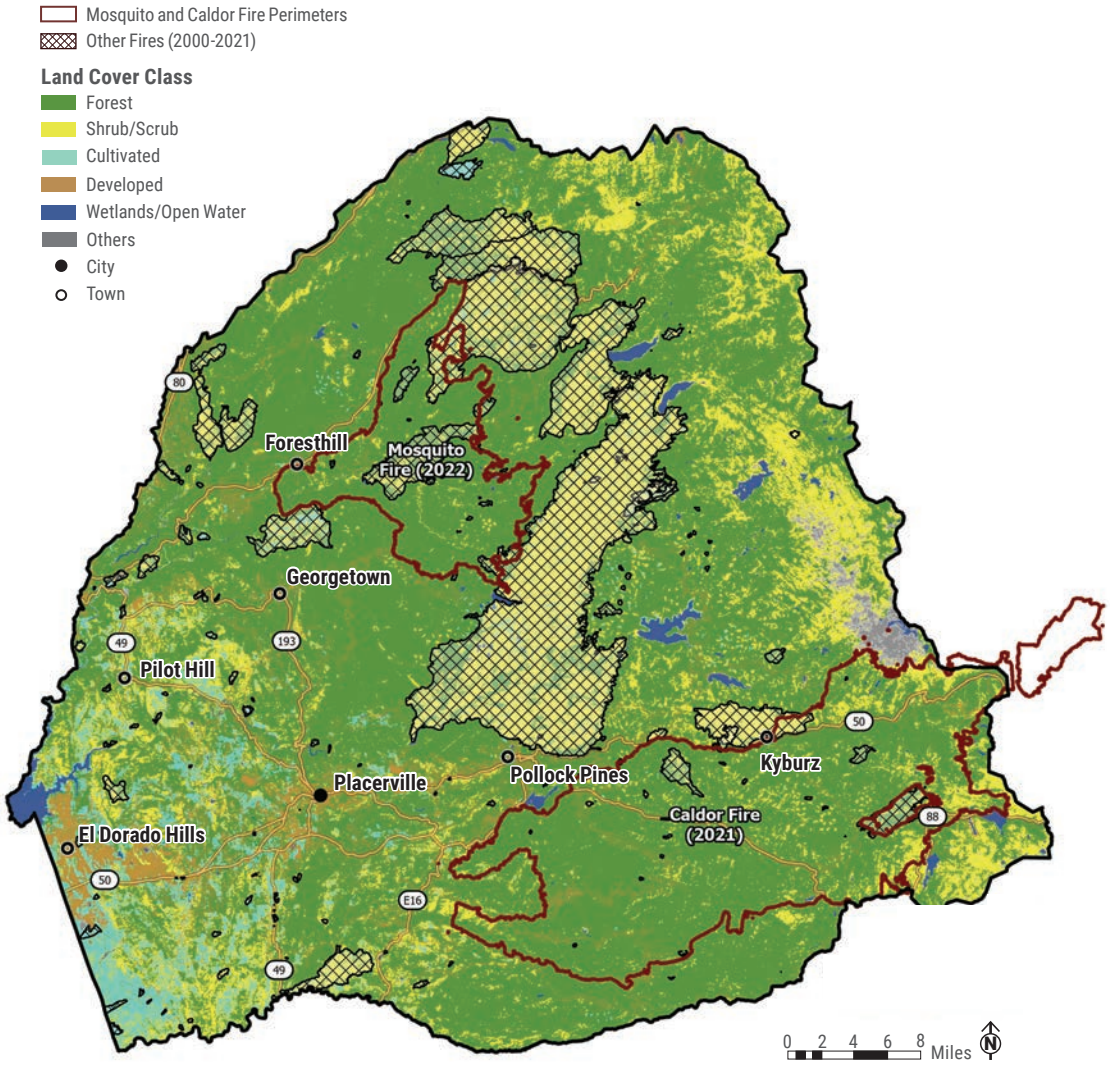
The benefits of wildfire prevention, however, are not limited locally or regionally. In addition to life loss and property damage, wildfires can easily wipe out accomplishments from years of efforts in cutting emission. According to researchers at University of California, Los Angeles, the estimated carbon dioxide equivalent released in 2020, the record fire season in recent California history, was about 127 million metric tons, compared with about 65 million metric tons of reductions achieved in California in the 18 years prior to 2020. California Air Resources Board's estimated that the 2021 Caldor Fire emitted 9.9 million metric tons of carbon dioxide equivalent from its impacted 215,733 acres; that is equivalent to the annual carbon dioxide emission from more than 2.15 million typical passenger cars. The comparison highlights the urgency and magnitude of significance of investing in healthy forests and sustainable forest management. It is also important to recognize that the challenges of investment prioritization can be very challenging for local governments and groups as they cannot do that alone sufficiently and effectively. This does not account for the public health concerns over the emission of 147 and 125 thousand short tons of particle materials that are 10 microns or less and 2.5 microns or less, respectively, during the Caldor Fire.

In rural counties where residents may be dispersed geographically, a more limited but equally challenging example of incomplete State policy implementation is the recent required collection of residential organic food waste per SB 1383 of 2022. Recognizing the importance of reducing short-lived climate pollutants, implementation without proper complementary measures can mean redirected impacts because of reductions in rural waste drop off at designated materials recovery facilities due to increased costs and increase burning of domestic waste resulting in increase in carbon emission.

The potential redirected impacts do not suggest that the original intent of associated law and regulations was misplaced, but rather that necessary incorporation of measures to accommodate local unique conditions in rural areas should be packaged for implementation to be complete.

A similar observation can be made for the requirements by SB 552 of 2021 to improve drought resilience for small water suppliers and domestic wells in rural counties, especially those in foothill areas with difficult terrains like the upper American River watershed. However, in this case, State provides financial and technical assistance programs to facilitate the initial implementation per significant advocacy from rural counties. The local leadership and proactive engagement by rural counties including EDC (through EDWA) are the key to this desired outcome.

Land covers are not steady over time. The large swath of shrub and scrub areas in the 2019 land cover map shown at right represent burn scars of the 2014 King Fire. The same landscape level of change also happened in the fire perimeters of the more recent Caldor and Mosquito Fires. The resulting impacts on ecosystem goods and services will take decades to recover.



The disconnect between policy planning and implementation can be a significant hurdle for intended improvement. The preferred rural-agricultural setting and associated quality of life in the upper American River watershed cannot be sustained without a vibrant agricultural economy that would rest on responsible cultivation development per county general plan policies in areas suitable for agricultural practices with concerted efforts in water, transportation, and other regional planning. As a result, the intended EGS and intended resilience and protection by well-managed working landscape can be realized.

The scale and complexity in the above examples of watershed management challenges can be overwhelming, and we are just beginning to acquire and share necessary data and knowledge to decipher the intricacy of networks that nature provides, and we modified. We do not only need to improve the acquisition and dissimilation of existing data, but also need to start the acquisition and assimilation of different data to better understand the direct and indirect consequences among our choices and actions.

3.2 Insufficient Information to Support Value Proposition for Watershed Management

Recursive and adaptive planning and implementation require significant resources and funding that are not affordable for a rural headwaters region like the upper American River watershed without alternative sources of funding, either in the forms of loans and assistance, or new approaches for revenue generation, cost allocation or project benefit-cost analyses. This is especially true because regulations are frequently changed to combat climate change and other associated resource conditions. Often, these laws and regulations impose practices and requirements that could be implementable in urban areas with relative ease but not in rural communities where resources are significantly limited. Or, they are reasonable for rural communities in the Central Valley, but not in the upper American River watershed in the foothill region and headwaters (e.g., without access to recognized groundwater basins for conjunctive use).

Local governments and residents in the upper American River watershed began to recognize the risks of being passive in engagement with State and federal governments in development of policies or formulation of regulatory approach that are historically norm. Meaningful engagement with State and federal agencies, however, requires science-based and technically sound information and data that highlight the uniqueness of our conditions in the watershed and the justification for support. Local leadership and collaboration are required for concerned efforts.

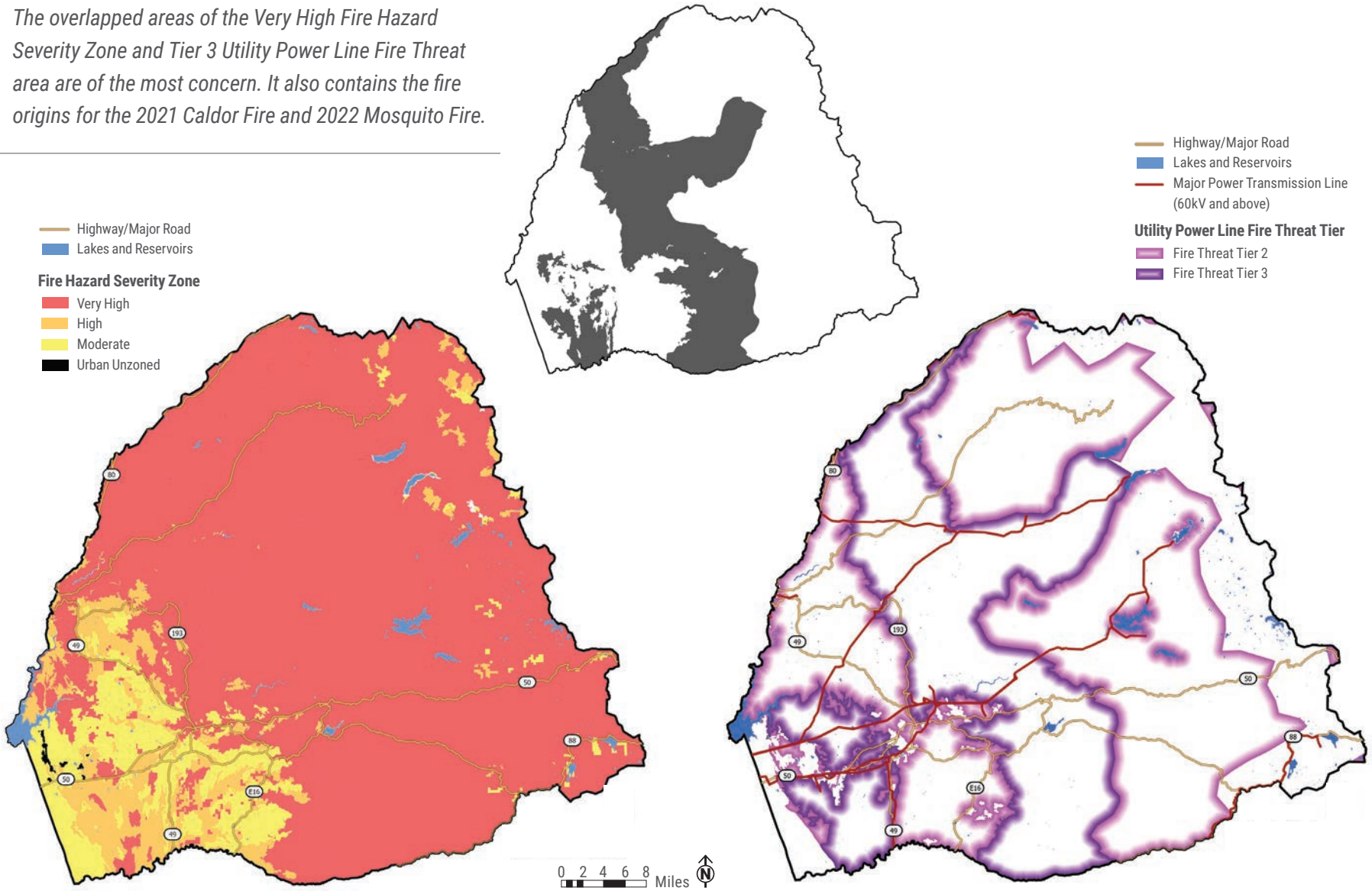
The level of complexity and required collaboration for implementing landscape-scale projects are much higher than traditional projects with limited scopes, requiring increased understanding of preferences and limitations of State and federal assistance, which could change from time to time or be program specific. For example, the El Dorado RCD, EDWA, and USFS are actively working to restore, post-Caldor Fire, the sole source watershed for the Grizzly Flats community, collectively leveraging federal and state recovery funding including a grant from Reclamation's WaterSMART Environmental Water Resources Projects Program while observing allowable scope and necessary conditions for using each funding.

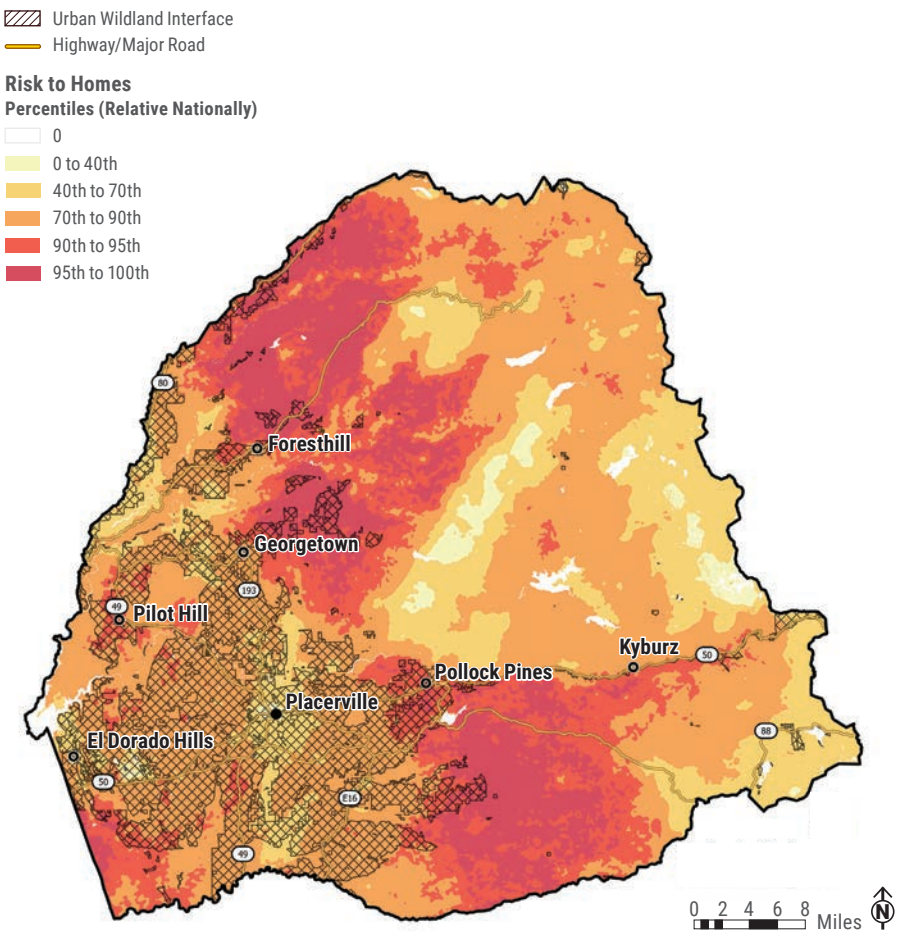
Regional implementation has been State's preference for funding and policy development, and the key to successful engagement with federal agencies for mutually beneficial actions and assistance. Therefore, it is essential for the communities in the upper American River watershed to exercise their leadership in developing a regionally supported plan that addresses the locally unique conditions and needs, and thus, leverage the resulting plan effectively for State and federal assistance.

Public education and understanding of the importance of integrated and collaborative efforts to battle the challenges the watershed is facing and will face are critical to build on-the-ground support. Science-based and result-oriented planning and implementation requires systematic data acquisition and effective information sharing. In addition, local governments, business interests, and educational institutes need to quickly augment the insufficient workforce for performing tasks needed for existing and emerging needs.

In addition to the above-mentioned resource deficiency and misalignment in policy and practice, lack of understanding and proper valuation of EGS that is closely connected to all aspects of watershed management and the benefits we have enjoyed creates obstacles in effectively assessing potential equitable funding mechanisms based on principles of beneficiary pay to support sustainable watershed management. This knowledge deficiency also put UARWG partners in disadvantage as the trend of federal and State policies are moving toward recognition of value of natural assets.

The overlapped areas of the Very High Fire Hazard Severity Zone and Tier 3 Utility Power Line Fire Threat area are of the most concern. It also contains the fire origins for the 2021 Caldor Fire and 2022 Mosquito Fire.





A 2018 analysis by Federal Emergency Management Agency showed that areas with overlapping power line fire threat and high/very high hazard severity zones pose extremely high risk to homes on a national level, especially those areas within the Urban Wildland Interface. The burn scar from the 2014 King Fire is clearly visible on the map below, showing substantially reduced risk due to less dense vegetation in that area. The effects of the Caldor and Mosquito fires are not reflected in this map. Conditions in the upper American River watershed are changing quickly and updates to fire threat data are critical to communicating risk to residents and helping forest managers prioritize their efforts.

The State has existing policies for expanding nature-based climate solutions by restoring nature and landscape health. Early in 2023, the *National Strategy to Develop Statistics for Environmental-Economic Decision* by the Office of Science and technology Policy, Office of Management and Budget, and Department of Commerce to officially put the value natural assets on the balance sheet. FEMA is an early adopter of using EGS values in the benefit-cost analyses for its hazard mitigation assistance program, and EDC has successful applications of such an approach in project justifications.

Other basic data and information needed for science-based and result-oriented watershed management is also insufficient, fragmented, and with significant unquantifiable uncertainty. Understanding the status and health of meadows and forests and their additional attributes can be important in order to assess the level of nature-based solutions may contribute to water regulations for water supply and flood management. Information about dry wells during drought conditions are critical to understand the vulnerability of rural communities and widely-dispersed residents in the upper American River watershed; however, there are no consistent records because the residents do not have sufficient trust toward local and State agencies to overcome the concerns over potential negative impacts on their real estate values from information sharing and reporting.

Data acquisition and information development can be expensive with intense requirements for upkeeping and management. In some cases, valuable data and information are available or partially available, but not shared or published for external uses. Technological advancements also provide substantial opportunities for alternative means of data collection and analyses. Compromised outcome and data acquisition for improving watershed understanding can be can result from uncoordinated actions or lack of adequate understanding about watershed needs and management directives.

Water is the primary pathway for realizing EGS the upper American River watershed can provide. The availability and regulation of water are under threat due to the increase in extreme conditions (droughts and floods). However, uncertainty of long-term climate forecast remains to be the greatest for water management despite the advancements in climate modeling and technology. The sub-seasonal to seasonal (2 weeks to 2 years) forecasts are the most important but also the most challenging. There are substantial investments on federal and State levels for improving measurements and technology for additional data acquisition, modeling and results dissemination, and assimilation of different sources of information and forecast to improve overall forecasting skills. Local investment in complementary data and information development may be necessary. However, more importantly, partners in the upper American River watershed need to articulate information and data that could benefit local use and watershed management to benefit the ongoing significant federal and State investments.

3.3 Diminishing Capacities of Water Regulating and Passive Use of Nature-Based Solutions

Water stored as snow over the winter represents the largest source of stored water in the watershed. Headwaters and foothill reservoirs rely on the melting snowpack to refill during the spring, provide water supplies for communities, generate power, and meet environmental flow and water quality requirements during the dry summer and fall seasons. One of the most prominent impacts of climate change in the upper American River watershed, as depicted in the 2022 American River Basin Study (see Chapter 1), will be a reduction in snowpack as more precipitation is expected to be in the form of rain instead of snow, resulting in seasonal runoffs occurring earlier in a year. The change in hydrology will have significant impacts on all water-dependent beneficial uses and EGS within and from the upper American River watershed. Most noticeably, it will result in a significant reduction in regional and statewide water supply reliability, and increase in flood risks for local communities and more prominently, the Sacramento metropolitan area downstream from Folsom Dam.

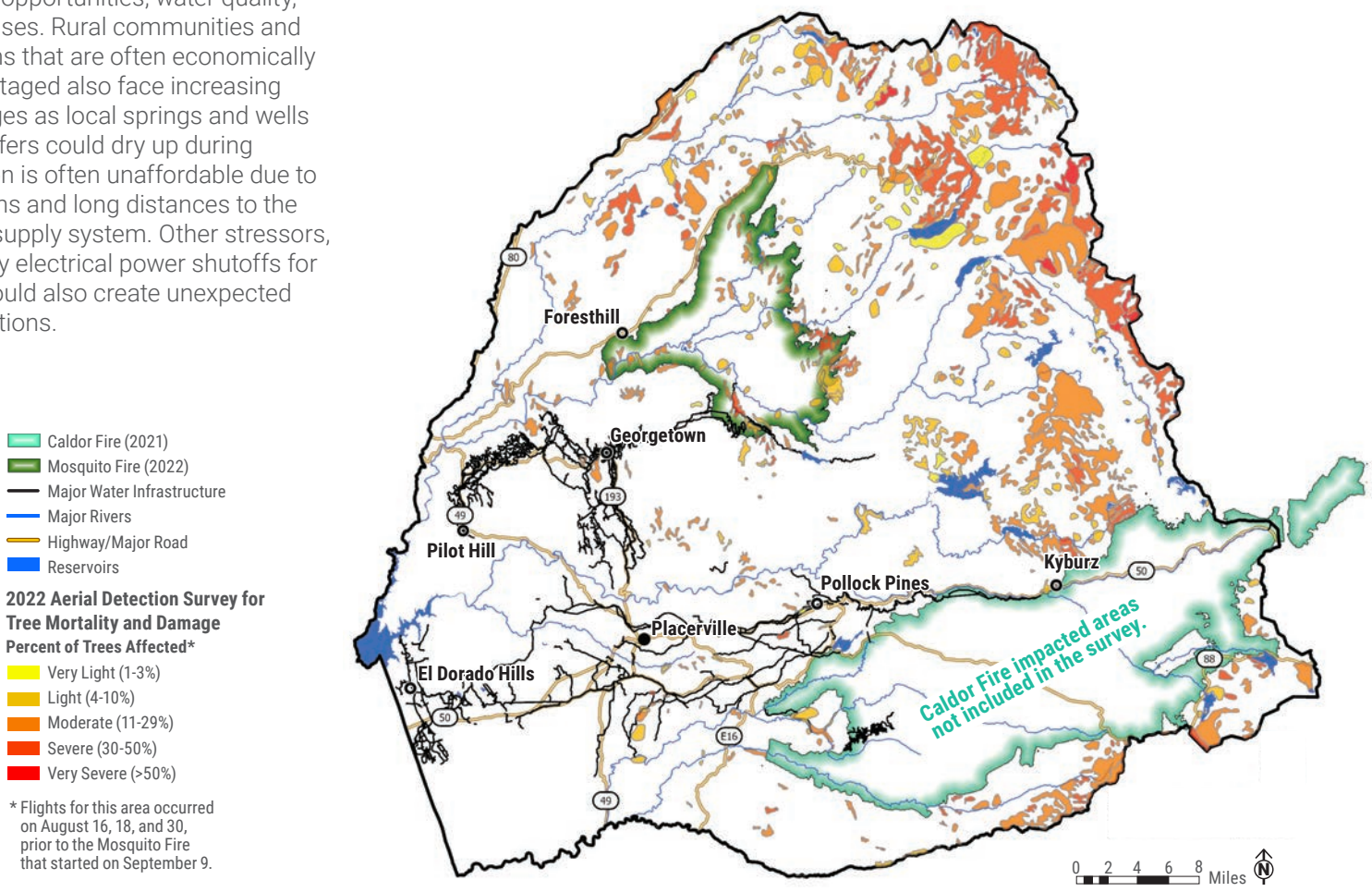
The above identified challenges are because the current built storage infrastructure in the watershed was not designed or sized for these radically changed conditions and cannot be operated to deliver similar benefits that were provided in the past. The increase in storm precipitation and intensity, especially during atmospheric river events, also elevated the concern over the safety of dams and other infrastructure in the watershed. Furthermore, the effectiveness of man-made storage infrastructure is also affected by the health of meadows and forests.

Degraded meadows reduced the ability of the watershed to retain water for later in season, and exacerbated flooding conditions. Meadows are nature-based solutions for water storage and quality management by providing water retention and filtering processes. Therefore, degrading meadow conditions could exacerbate the diminishing of water regulating capacity in the watershed in addition to the increasing ineffectiveness of man-made storage infrastructure. Additionally, overgrown forests with extensive canopy may prevent snowpack

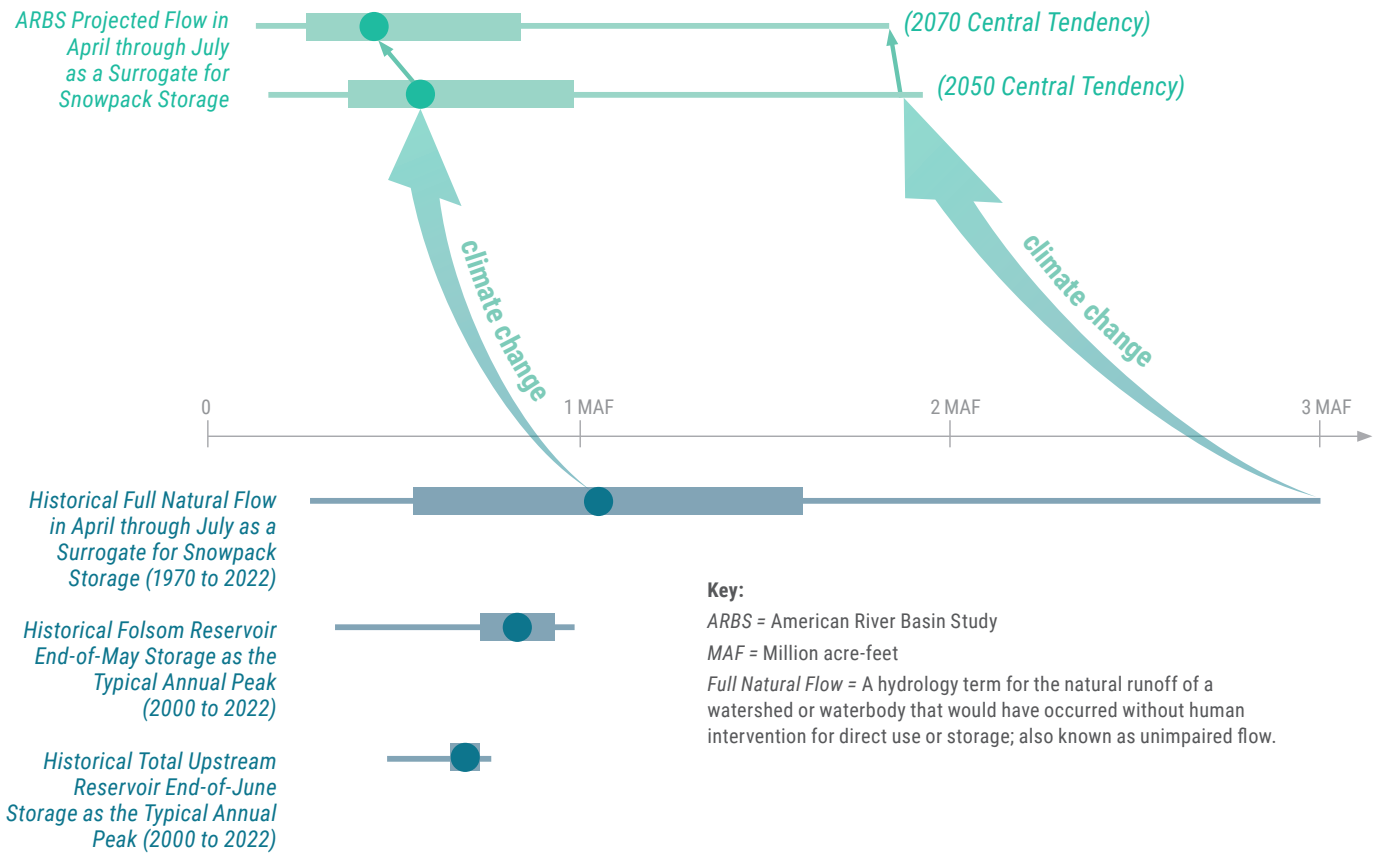
from forming on the ground, causing more evaporation and earlier snowmelt runoff and thereby reducing infiltration to the already unreliable and unpredictable fractured rock aquifers in the foothills of the upper American River watershed.

On a more refined level, the challenging foothill terrain presents additional difficulties. Hydrologic conditions can vary significantly from one sub-watershed to another, affecting water-related habitats, recreational opportunities, water quality, and other beneficial uses. Rural communities and domestic well systems that are often economically and socially disadvantaged also face increasing water supply challenges as local springs and wells in fractured rock aquifers could dry up during drought. Consolidation is often unaffordable due to the challenging terrains and long distances to the nearest major water supply system. Other stressors, including public safety electrical power shutoffs for wildfire prevention, could also create unexpected water shortage conditions.

U.S. Forest Service's 2022 Aerial Detection Survey for tree mortality and damage suggested severe conditions in high elevation areas in the watershed. Although away from the communities in the West Slope, the Caldor Fire proved that cross-watershed burning is possible and thus, communities in Tahoe Basin are potentially at risk.



Historically, snowpack has served as a natural water storage with a volume that is up to three times larger than combined storage of the built storage facilities in the watershed. This snowpack provides water for all beneficial uses in late spring through the dry fall period. Snowpack volumes are estimated to be significantly reduced under climate change, up to 1 million acre-feet less, creating significant challenges for all water-dependent ecosystem goods and services.



Recognizing counties as the response unit under the current statewide emergency response structure, SB 552 requires counties to establish a long-standing Drought and Water Shortage Task Force and to develop a plan to improve the planning and mitigation of potential water shortages caused by any emergency, including droughts. SB 552 implementation is also connected to other state policies and requirements, such as AB 685 of 2012. Also known as the Human Right to Water law, AB 685 declares that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. Even with these water management planning efforts in place, drought preparedness and mitigation actions face coordination and resource-sharing challenges, technical barriers related to data and analytical tools, and funding and implementation obstacles.

Wildfires further complicate the prospect of diminishing water regulating capacity in the watershed. These wildfires occurred during the multi-year drought emergency which started in 2020 but were followed by the January 2023 bomb cyclones which created significant flooding in Cameron Park and other communities. Incidentally, California was in both statewide emergencies for drought and for flood.

The high intensity and frequency of these storms, which were historically abnormal but are expected to continue under climate change, exceeded the design capacity for local stormwater systems and field infiltration capacity. Wildfires further exacerbated the runoff conditions because burned soils have a significantly reduced capacity for infiltration and retention. The sediment from the burned areas could overwhelm water treatment facilities, causing rare conditions of water supply restrictions. This threat is real for small water suppliers and large ones alike. EID issued a water conservation order to its customers during a record-breaking precipitation event in early 2023 due to degraded water quality caused by runoff from the burn scar that severely impacted water treatment processes and also challenged the ability of EID to meet applicable drinking water standards until water quality conditions improved.

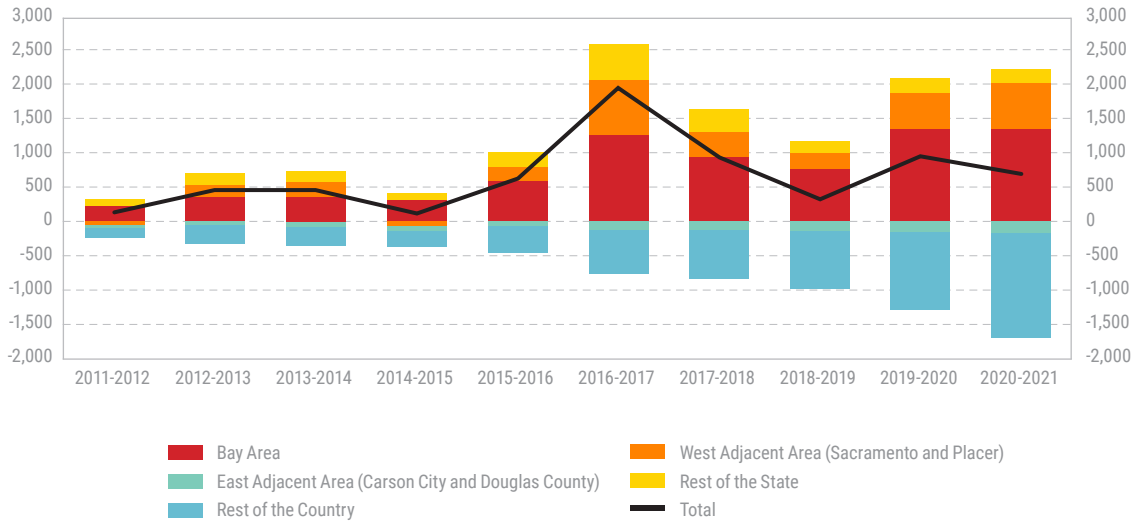
Progress is being made through a broad range of innovative drought adaptation strategies with multi-benefit impacts. For example, aquatic features such as wetlands and rivers have the potential to store a significant amount of water. Restoring these features can increase the water storage capacity of the landscape and help mitigate the effects of drought on natural capacity in the watershed. Meadow restoration is an example of such type of adaptation strategy with multi-benefits that can help store the water, improve water quality, provide wildlife habitat, control erosion, and most importantly, sequester carbon to mitigate climate change impacts.

Past water management overly focused on using man-made infrastructure for water storage, conveyance, and regulation purposes. However, shortcomings of this traditional approach become clear as the intensity and frequency of extreme weather conditions continue to increase as climate change progresses, as well as the costs of developing and maintaining built infrastructure. Incorporating nature-based solutions in water regulating functions for water supply and flood management purposes becomes necessary and more sensible under climate change to improve efficiency and prolong effectiveness of built infrastructure and associated investments. The concept of nature-based solutions is very accessible; however, establishing an equitable cost sharing mechanism with the principles of beneficiary pay remains challenging due to the lack of recognition of EGS in traditional cost-benefit analysis, and precision in benefit quantification equivalent to that for built infrastructure. The above complexity highlights the importance of improving understanding of availability and quality of natural capital assets and the resulting EGS. It also suggests the needs of improving climate and water availability forecast skills both in its lead time and accuracy to improve preparedness for the unexpected.

3.4 Pressures of Urbanization and the Urban Exodus

Regional economic development, more affordable housing and better quality of life are among the reasons for the steady population increase in the greater Sacramento-Placer-El Dorado areas over the past decades. The upper American River watershed is largely rural-agricultural; in particular, El Dorado County has a more conservative growth policy than nearby counties like Sacramento and Placer, or cities like Folsom. As California experiences the first ever population decrease in decades, the pressure of urbanization is mostly from adjacent development. However, the pace of growth accelerated during the COVID-19 pandemic with an increasing urban exodus, especially from the Bay Area. The ongoing pressure of urbanization has resulted in the loss of forest and ranch lands and increased wildfire risks because of asset accumulation through development, as well as new residents not fully comprehending the risks of living alongside wildlands and the mitigation actions they must take to protect their properties. Properly maintained defensible space and fire-appropriate choices in home construction materials are the most cost-effective ways to protect communities, regardless of measures taken on adjacent lands to establish and maintain landscape-scale fuel breaks.

The net migration to EDC shows an increasing urban exodus trend, based on year-to-year address changes reported on individual income tax returns filed with the Internal Revenue Service. While the total increase in population is limited, the demographic and cultural changes associated with migration patterns have meaningful effects on awareness and preparedness for living in the WUI, and other aspects of life in the rural-agricultural dominated region. This EDC data is considered representative for the watershed given that most of Placer County's current growth is in areas outside of the upper American River watershed, namely in Western Placer.



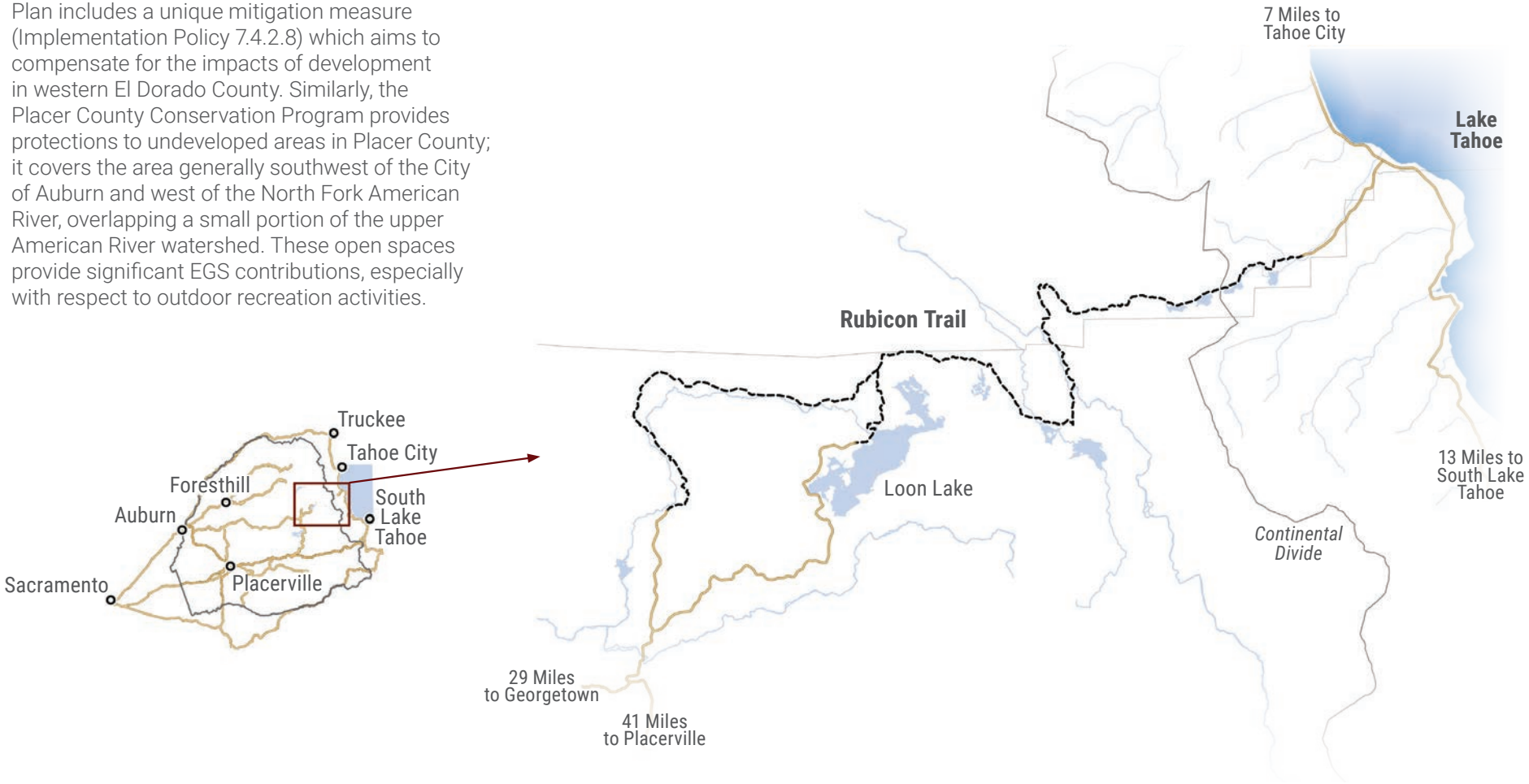
It is challenging for fire management agencies to perform a comprehensive review of individual homeowner's status of compliance with applicable law and regulations. Therefore, instilling value of these protective measures in homeowners, especially new residents moving from urban areas, and formulating community fire protection plans become challenging for community entities like FSC.

Wildfire preparedness and resilience are also important topics for updates to the General Plan safety element and potential ordinance and building code requirements. Transportation planning needs to also consider the adequacy of community evacuation routes during wildfire emergencies, and contingency planning. More importantly, the desired rural-agricultural way of life cannot be sustained without a healthy agricultural economy, which is under pressure from land conversion and urbanization. Agricultural activities and associated tourism, as exemplified by the Apple Hill region near Placerville, could provide managed open spaces and realize the intended EGS and agricultural economy. Yet, the anticipated levels of agricultural economic development identified in the general plans face obstacles including lack of supporting infrastructure (e.g., access roads, water conveyance, and broadband connections) and resources (e.g., water supplies, workforce, and other services), representing a missed opportunity for local economic development to sustain rural communities.

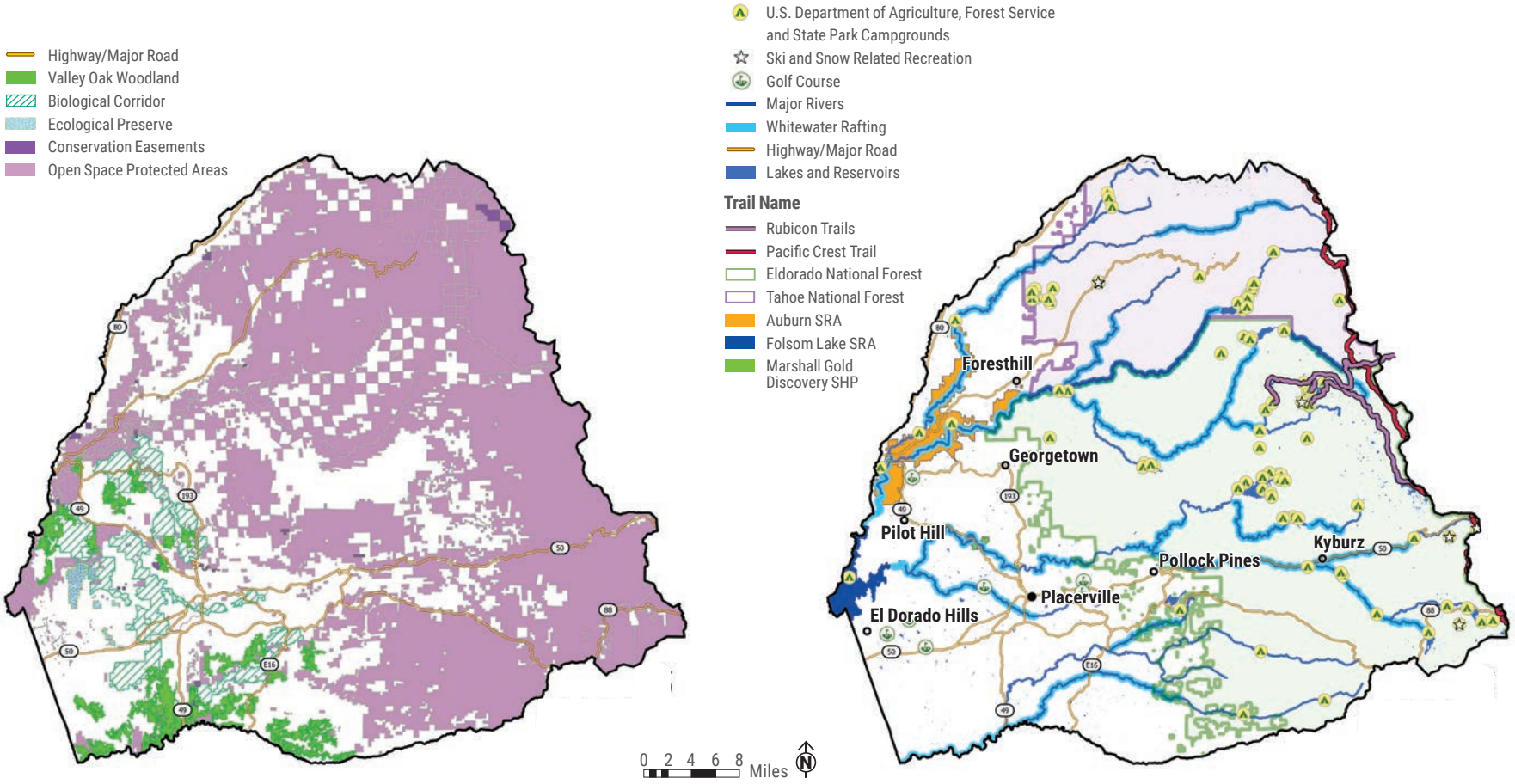
3.5 Difficulties in Protecting Open Spaces and Meeting Outdoor Recreation Demands

A significant portion of the lands in the upper American River watershed are under protective status to remain as open space, through a combination of land use designations or conservation easements. These open spaces are part of the mitigation measures for planned development and provide significant outdoor recreation opportunities. The EDC General Plan includes a unique mitigation measure (Implementation Policy 7.4.2.8) which aims to compensate for the impacts of development in western El Dorado County. Similarly, the Placer County Conservation Program provides protections to undeveloped areas in Placer County; it covers the area generally southwest of the City of Auburn and west of the North Fork American River, overlapping a small portion of the upper American River watershed. These open spaces provide significant EGS contributions, especially with respect to outdoor recreation activities.

The Central Valley Water Quality Control Board's 2009 Cleanup and Abatement Order to El Dorado County and U.S. Forest Service for the famous Rubicon Trail was to respond to the sanitary and water quality impacts from off-road enthusiasts. The trail would not be open today if not for the County's successful Yellow Bandana Campaign to eradicate the infamous "white flowers" and significant community efforts for education and cleanup.



Maintaining the vast open spaces in the upper American River watershed for intended EGS and to respond to the significant increase in demand of outdoor recreation is challenging without sustainable funding and workforce, targeted educational campaign for recreation users for environmental sensitivity, and supplemental support by volunteers and community groups.



Outdoor recreation in the upper American River watershed exploded during and after the COVID-19 pandemic, a general trend shared by many other rural areas throughout the nation. Outdoor recreation is critical to sustain rural communities. In the upper American River watershed, it is a significant economic driver and source of enjoyment for residents and visitors alike. Common recreational activities include hiking, camping, rafting, kayaking, canoeing, boating, hunting, swimming, and biking in established areas or wilderness. The 22-mile Rubicon Trail is among the most popular off-highway vehicle trails in the U.S., generating about $57.4 million per year in direct spending, plus an additional $16 million per year in spending for El Dorado County and $9.8 million per year in spending for Placer County. The Desolation Wilderness offers unique terrain and scenery above the tree line. White water rafting and kayaking in all three forks of the American River are popular activities in warmer months, while skiing and other snow-related activities are popular in winter.

The vast outdoor recreation opportunities rely on a healthy watershed and built infrastructure (e.g., reservoirs, roads) to enhance the experience. The downside of the rapid expanding outdoor recreation may be realized in areas including physical impacts on meadows, plants and habitats, water quality impacts from improper waste disposal, and increase in erosion and risks of landslides. The maintenance and mitigation of resulting environmental impacts can be costly, as evidenced by the efforts in complying with the Cleanup and Abatement Order in early 2010s to avoid seasonal closure or other measures to limit access and use of the Rubicon Trail.

While potentially benefiting rural community economy, an increase in outdoor recreation use in the upper American River watershed without implementing necessary measures to enhance management strategy and enforcement actions could become a burden and financial liability for associated managing agencies. Other than areas managed commercially, counties, USFS and corresponding property owners are liable for maintenance using the often insufficient available financial and labor resources, relying on contributions from volunteers and community groups that may not be sustainable or reliable.

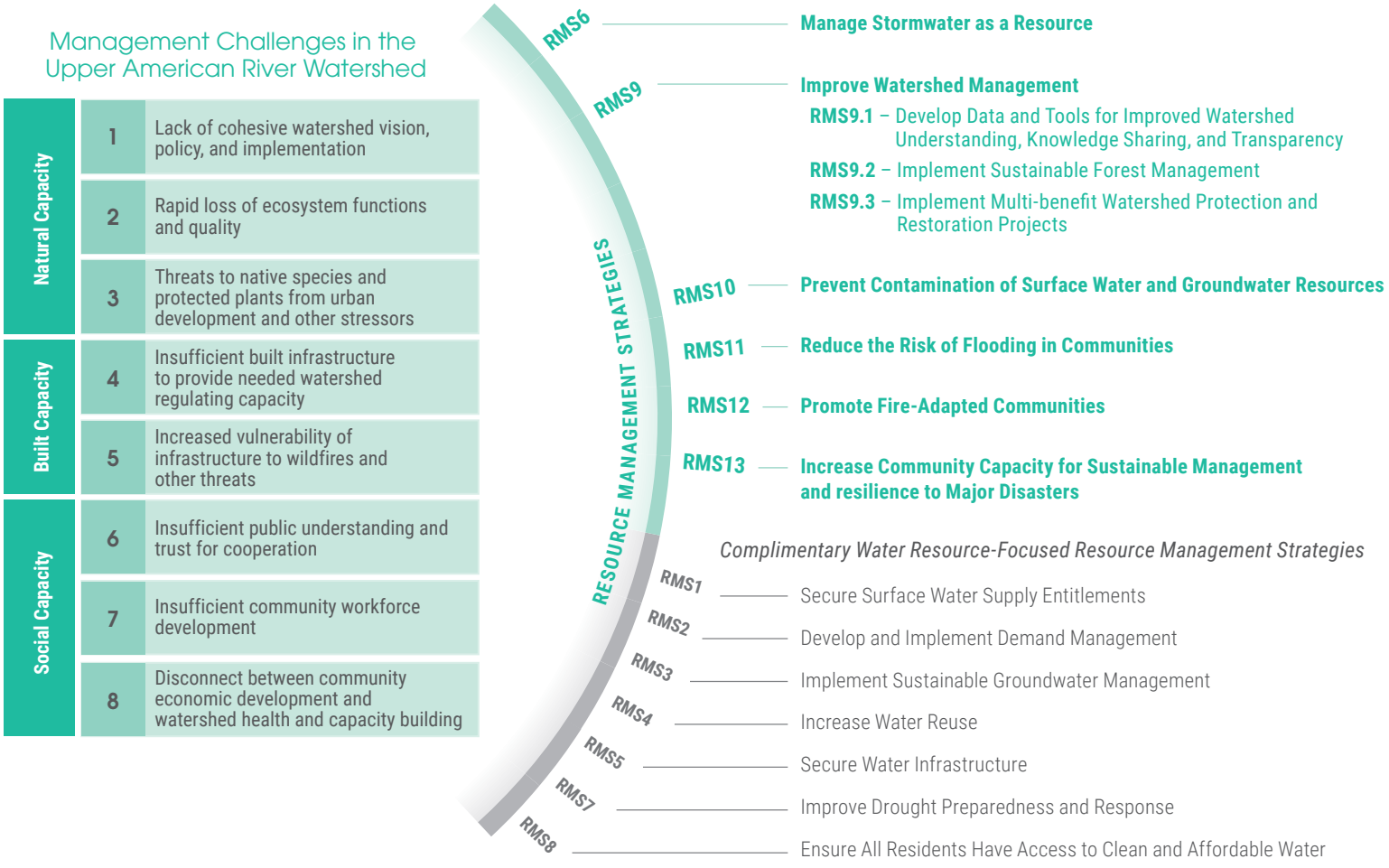
Increase in outdoor recreation use could also increase use of major highways and connecting county roads, resulting in increase in traffic and road congestion, and associated costs for maintenance, mitigation and improvement costs. Without proper planning, transportation could degrade outdoor recreation opportunities and experiences.

Sustainable funding and workforce support for proper management and maintenance of outdoor recreation areas are a major challenge for the upper American River watershed with more than 56 percent of land are for open space. Public education and targeted campaigns to improve awareness and facilitate behavior changes of novice and experienced outdoor recreation users are also critical for reducing long-term maintenance and replacement costs. In some cases, partnerships are formed to provide mutually beneficial arrangements for cost sharing (e.g., as a benefit sharing practice, SMUD is responsible for snowplowing the county road to their Loon Lake facilities). Prudent and proactive planning and partnership are imperative to properly incorporate the anticipated needs for supporting intended land use and realization of associated EGS.

4

Resource Management Strategies

To address the watershed challenges described in Chapter 3, strategic actions and approaches will need to be taken on a broad, watershed scale by a combination of implementation partners. While some actions, as mentioned in Chapter 3, to help address these challenges are ongoing, there is still a long way to go. As such, 13 broad resource management strategies, or RMS, were identified. Given the close interrelationship between watershed health and associated water production, the RMS incorporates water resource-focused ones for completeness, as shown in the figure below. Due to the interconnections between challenges and contributing factors, there are no one-to-one relationships between the identified challenges and the RMS. Each RMS has the potential to address one or more challenges, and coordination across all actions will maximize benefits. For each RMS, a list of management actions and associated principal implementing agencies are identified. Each management action could also include a project or a collection of like projects implemented by an individual agency or a group of implementation agencies, with or without further collaboration with other watershed partners for further expanded mutual benefits. Therefore, the roles of each principal implementation agency may vary from project to project to lead, facilitate or support for a given action depending on its authority, policy, available resources and other considerations.



4.1 RMS6 – Manage Stormwater as a Resource

Stormwater and runoff can be managed to prevent damage to communities and infrastructure, but it can also be managed as a beneficial resource in the watershed. The following RMS actions focus on managing stormwater volume and quality as a resource within the watershed.

RMS Actions	Principal Implementing Agencies
6a. Update Stormwater Resource Plans.	ED/PC, EDWA, Placerville, Auburn
6b. Implement water quality control measures and best management practices to address runoff from highways, streets, and other priority impervious areas.	ED/PC, Placerville, Auburn, CSD(WQ)
6c. Implement Stormwater Management Plan (now also as part of the Stormwater Resource Plan) and California Municipal Separate Storm Sewer Systems Permits.	ED/PC, Placerville, Auburn

Key

Auburn = City of Auburn
CSD(WQ) = Community Service District with water quality management responsibilities
ED/PC = Counties of El Dorado and Placer
EDWA = El Dorado Water Agency
Placerville = City of Placerville

4.2 RMS9 – Improve Watershed Management

RMS9.1 – *Develop Data and Tools for Improved Watershed Understanding, Knowledge Sharing, and Transparency*

Data collection and data sharing are critical to making informed planning decisions and effectively allocating resources to address challenges. A transparent and accessible data system advances cooperation in watershed management, consolidates data collection activities among partners, and provides a common platform for understanding evolving watershed conditions.

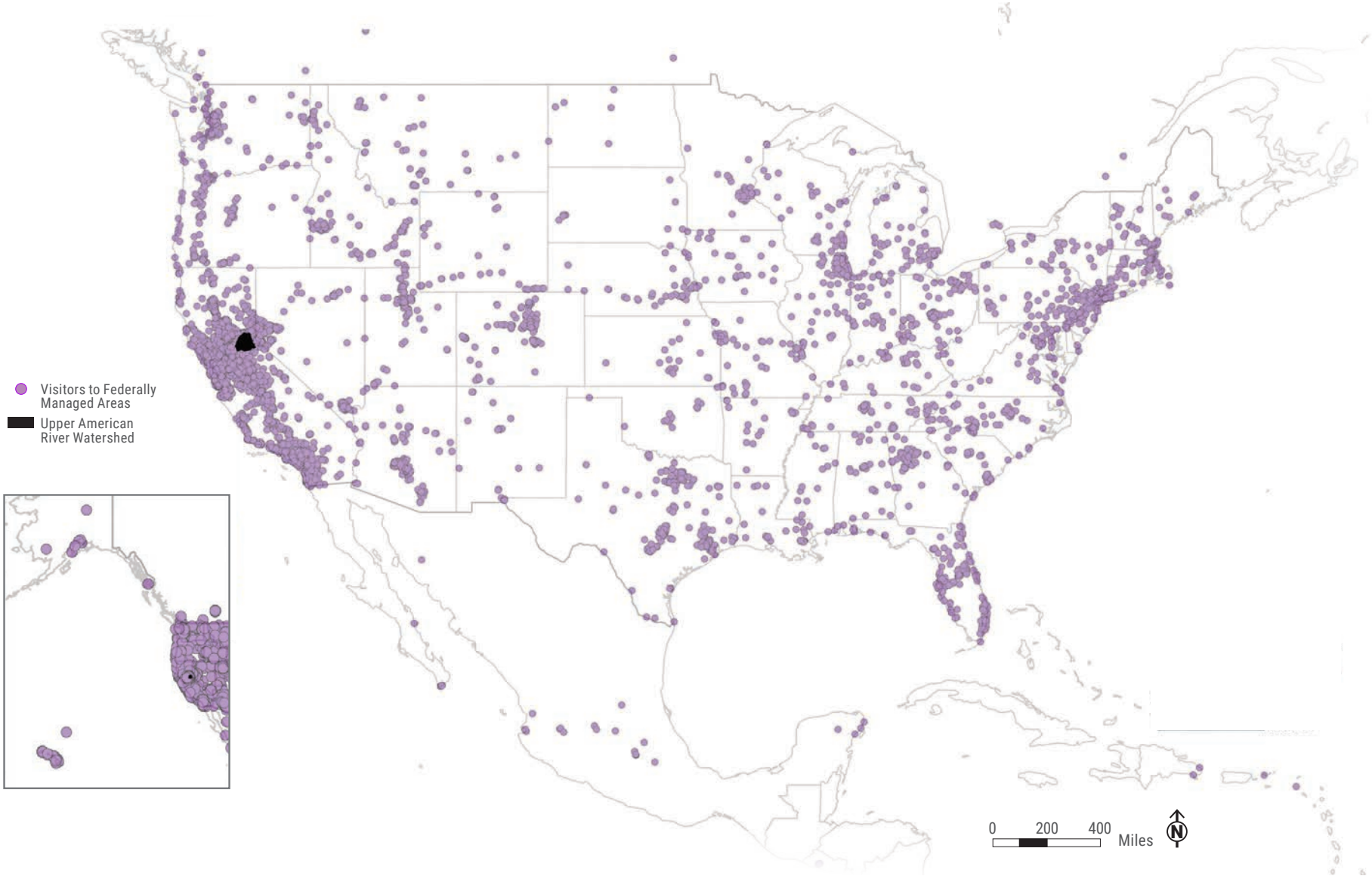
RMS Actions	Principal Implementing Agencies
9.1a. Improve hydrological and meteorological data acquisition to support planning needs and improve forecasting.	DWR, EDWA, GDPUD, EID, RCD, SWB, SMUD, SAFCA, PCWA
9.1b. Develop and synthesize the potential economic values of ecosystem goods and services in the upper American River watershed to help properly characterize the value of the watershed.	EDWA, ED/PC, RCD, USFS, BLM, FB, FSC, EID, PCWA, GFCSD, GDPUD, Tribes
9.1c. Develop and maintain a common platform that is publicly accessible for sharing water resource-related data and analytical tools, to avoid duplicate investments in their development and promote transparency.	EDWA, EDC, RCD, ARC
9.1d. Assess the impacts of recent wildfires on ecosystem goods and services, including water supply, flood, water quality (including sedimentation), power generation, and outdoor recreation.	EDWA, ED/PC, RCD, USFS, BLM, FB, FSC, EID, PCWA, GFCSD, GDPUD, ARC, Tribes
9.1e. Develop a cultural heritage management strategy in collaboration with Tribes, including protocols for collaboration and consultation.	ED/PC, Tribes, EDWA, PCWA
9.1f. Inventory upper American River watershed forests for vegetation types and other attributes to support wildfire mitigation efforts.	USFS[1], RCD, ED/PC, ARC
9.1g. Inventory upper American River watershed headwater meadows.	USFS, ED/PC, RCD, ARC, SMP

Note: 1. USFS shares authoritative agency data through the Enterprise Data Waterhouse, available at: Enterprise Data Warehouse | US Forest Service (usda.gov).

Key

ARC = American River Conservancy
DWR = California Department of Water Resources
ED/PC = Counties of El Dorado and Placer
EDWA = El Dorado Water Agency
EID = El Dorado Irrigation District
FB = Farm Bureaus, including El Dorado County Farm Bureau and Placer County Farm Bureau
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District
PCWA = Placer County Water Agency
RCD = Resource Conservation District, including El Dorado Resource Conservation District, Georgetown Divide Resource Conservation District, and Placer Resource Conservation District
SAFCA = Sacramento Area Flood Control Agency
SMP = Sierra Meadows Partnership
SMUD = Sacramento Municipal Utility District
SWB = State Water Resources Control Board
Tribes = Native American tribes, including Shingle Springs Band of Miwok Indians and United Auburn Indian Community
USFS = U.S. Department of Agriculture, Forest Service

The ongoing recreation study conducted by EDWA using 2022 cell phone data reveals the visitation pattern to federally managed lands in the Planning Area, with the most heavy visitation from the Bay Area and greater Sacramento region, but also from throughout the country.



RMS9.2 – *Implement Sustainable Forest Management*

Forest lands cover much of the upper American River watershed and forest management actions have both direct and indirect impacts on water availability and quality, EGS, local economies, and public safety within and downstream from the upper American River watershed. Many federal, state, and local agencies share responsibilities for forest and headwater health, making collaboration and coordination critical to successful watershed management.

RMS Actions	Principal Implementing Agencies
9.2a. Assess the health of upper American River watershed forests, under existing and planned levels of hazard reduction management.	USFS, RCD, ED/PC, ARC, SOFAR, FSC
9.2b. Develop a regional post-fire forest restoration plan that promotes consistent management practices to support long-term forest health and public safety and cross-connects lands managed by federal agencies, local agencies, and private entities.	ED/PC, USFS, RCD, EID, SMUD, PCWA, BLM, SPI, FSC
9.2c. Develop a watershed-level forest management strategy, consistent with the National Cohesive Strategy, that promotes common management practices for long-term forest health and public safety and cross-connects lands managed by federal agencies, local agencies, and private entities.	ED/PC, USFS, RCD, EID, SMUD, PCWA, BLM, SPI, FSC
9.2d. Expand options for using and disposing of woody biomass.	ED/PC, GDPUD, GFCSD, PCWA
9.2e. Collaborate with resource management agencies, power utilities, water purveyors, and interested parties to promote sustainable forest management strategies that provide long-term benefits to water supply, infrastructure, biodiversity, and ecosystem functions.	ARC, USFS, CAL FIRE, SNC, ED/PC, SPI, PG&E, PCWA, SMUD, EID, GDPUD, GFCSD, RCD, SOFAR

Key

ARC = American River Conservancy
BLM = U.S. Department of the Interior, Bureau of Land Management
CAL FIRE = California Department of Forestry and Fire Protection
ED/PC = Counties of El Dorado and Placer
EID = El Dorado Irrigation District
FSC = Fire Safe Councils
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District
PCWA = Placer County Water Agency
PG&E = Pacific Gas and Electric Company
RCD = Resource Conservation District, including El Dorado Resource Conservation District, Georgetown Divide Resource Conservation District, and Placer Resource Conservation District
SPI = Sierra Pacific Industries
SMUD = Sacramento Municipal Utility District
SNC = Sierra Nevada Conservancy
SOFAR = South Fork American River Cohesive Strategy
USFS = U.S. Department of Agriculture, Forest Service

RMS9.3 – *Implement Multi-benefit Watershed Protection and Restoration Projects*

Many projects in the watershed can be developed and implemented to provide multiple benefits, from helping to improve water quality, reduce flood risks, and support resilient ecosystems to creating opportunities for regional collaboration. Multi-benefit projects can also help maximize the benefits from watershed investments and efficiently leverage limited resources.

RMS Actions	Principal Implementing Agencies
9.3a. Improve vegetation management with livestock grazing.	ED/PC, EDWA, ARC, NRCS, UCCE
9.3b. Implement invasive species management.	WMG
9.3c. Assess the health of upper American River watershed headwater meadows using the inventory from RMS9.1g.	RCD, SMP, ARC, ED/PC
9.3d. Implement headwater meadow restoration to improve water retention for water supply and flood risk reduction, water quality, and other ecosystem functions, including outdoor recreation.	RCD, USFS, NGO, ARC, ED/PC, CABY
9.3e. Develop an agricultural economy consistent with the ED/PC General Plans and working landscape principles to realize its potential for applicable ecosystem goods and services.	ED/PC, EDWA, FB
9.3f. Implement water resource-related infrastructure development and modifications, incorporating considerations to promote co-benefits from compatible ecosystem goods and services and increased flexibility in public financing for implementation.	ED/PC, EDWA, EID, GDPUD, PCWA
9.3g. Establish conservation easements and preservation with willing landowners that promote co-benefits from compatible ecosystem goods and services.	ED/PC, NGO, ARC, RCD
9.3h. Conduct research on alternatives and options for disposing short-lived climate pollutants (e.g., organic food waste) without redirecting impacts on environment or local economy.	ED/PC, NGO

Key

ARC = American River Conservancy
CABY = Cosumnes, American, Bear & Yuba Integrated Regional Water Management Group
ED/PC = Counties of El Dorado and Placer
EID = El Dorado Irrigation District
EDWA = El Dorado Water Agency
FB = Farm Bureaus, including El Dorado County Farm Bureau and Placer County Farm Bureau
GDPUD = Georgetown Divide Public Utility District
NGO = Nongovernmental Organizations
NRCS = US Department of Agriculture, Natural Resources Conservation Service
PCWA = Placer County Water Agency Conservation District
RCD = Resource Conservation District, including El Dorado Resource Conservation District, Georgetown Divide Resource Conservation District, and Placer Resource Conservation District
SMP = Sierra Meadows Partnership
UCCE = University of California Cooperative Extension
WMG = Weed Management Group, including El Dorado County Invasive Weed Management Group and Nevada-Placer Weed Management Group

4.3 RMS11 – Reduce the Risk of Flooding in Communities

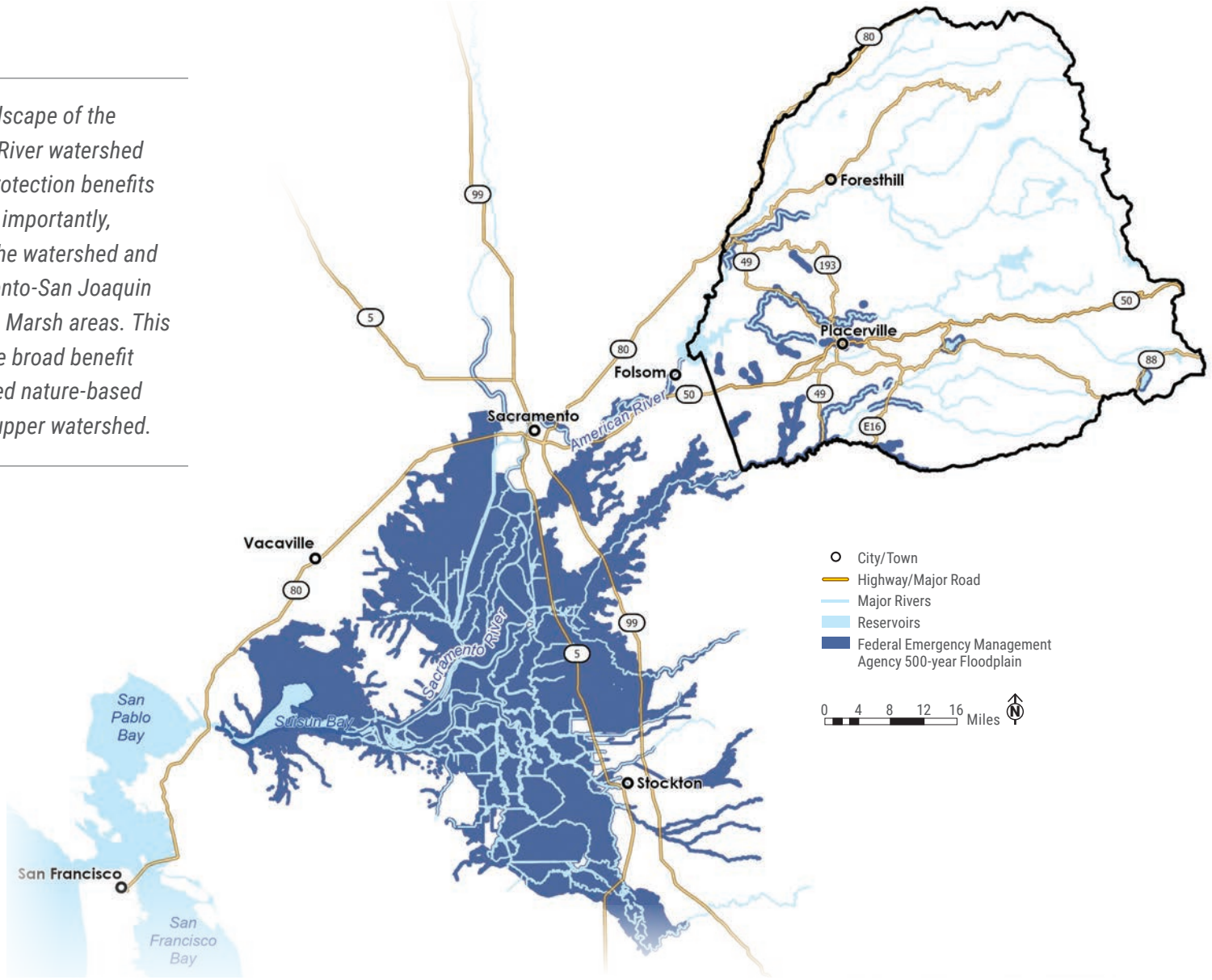
Due to its distinctive topography, aging flood infrastructure, and the occurrence of heavy rain-on-snow events, the upper American River watershed can experience intense, localized flooding. The watershed's water retention ability is limited due to reduced meadow functions, wildfires, and widespread tree mortality. Additionally, climate change has exacerbated severe flooding in recent years, causing damage to essential infrastructure within the watershed. Coordinated flood management efforts are necessary to protect the well-being of local and downstream communities.

RMS Actions	Principal Implementing Agencies
11a. Update potential risks of flooding and water infrastructure vulnerability.	ED/PC, EID, GDPUD, GFCSD, PCWA, Placerville, Auburn, CSD(Flood)
11b. Develop and implement flood risk reduction projects to reduce localized and neighborhood flooding.	ED/PC, Placerville, Auburn, CSD(Flood)
11c. Improve implementation of residual flood risk mitigation actions, including participation of the National Flood Insurance Program and voluntary use of flood-resistant materials and other California Building Code requirements, as appropriate.	ED/PC, Placerville, Auburn
11d. Incorporate the effects of climate change in the frequency and intensity of flood-causing storm events in facility planning (siting and design) for long-term sustainability.	ED/PC, EID, GDPUD, GFCSD, PCWA, CSD(Flood)
11e. Develop strategies and collaborate to combine nature-based solutions in the upper American River watershed to reduce expenditure, facilitate additional flexibility of pooled funding use, and prolong the effectiveness of hard infrastructure investment and operational changes for flood risk reduction in the greater Sacramento metropolitan area.	EDWA, ARC, RCD, SAFCA, PCWA, SMUD

Key

ARC = American River Conservancy
Auburn = City of Auburn
CSD(Flood) = Community Services Districts with flood management responsibilities
ED/PC = Counties of El Dorado and Placer
EID = El Dorado Irrigation District
EDWA = El Dorado Water Agency
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District
PCWA = Placer County Water Agency Conservation District
Placerville = City of Placerville
RCD = Resource Conservation District, including El Dorado Resource Conservation District, Georgetown Divide Resource Conservation District, and Placer Resource Conservation District
SAFCA = Sacramento Area Flood Control Agency
SMUD = Sacramento Municipal Utility District

The working landscape of the upper American River watershed provides flood protection benefits locally, but more importantly, downstream of the watershed and into the Sacramento-San Joaquin Delta and Suisun Marsh areas. This demonstrates the broad benefit areas of enhanced nature-based solutions in the upper watershed.



4.4 RMS12 – Promote Fire-Adapted Communities

The upper American River watershed is in very high or high FHSZ as delineated by CAL FIRE. The ongoing revisions is not expected to have major changes in these classifications. Devastating wildfires in recent years have caused widespread damage to homes, businesses, and infrastructure, while also impacting ecosystem health. Promoting fire-adapted communities through fuel reduction projects, creating defensible space, and educating the public can help reduce the risk of future wildfires and the damage they cause.

RMS Actions	Principal Implementing Agencies
12a. Update the County Safety Elements and City General Plans to protect communities from unreasonable risks of hazards, including wildfire and associated considerations of safe egress route requirements and California Building Code amendments for home fire hardening.	ED[1]/PC, Placerville, Auburn
12b. Update and enforce vegetation management and defensible space ordinances, including coordinate with CAL FIRE to prioritize County Focus Area inspections.	ED[2]/PC
12c. Update the requirements for building permits to have owner(s) acknowledge being located in CAL FIRE high and very high Fire Hazard Severity Zones, and for deed recording to provide sufficient evidence for meeting fire disclosure requirements by real estate property seller(s) and homeowner associations for common areas, if applicable per AB 38 of 2019.	ED/PC, Placerville, Auburn
12d. Develop a community wildfire protection plan, including the assessment of fire protection needs of communities within the Wildland Urban Interface in coordination with an associated implementation plan, including a financing plan and funding acquisition assistance.	ED/PC, FSC, USFS, BLM, Tribes
12e. Develop a public education campaign by leveraging FSC and similar channels to improve wildfire preparedness; improve resident awareness of relevant laws, regulations, and best management practices; and facilitate community-specific wildfire emergency preparedness and response plans.	ED/PC, FSC

Notes: 1. El Dorado County is currently in the process of updating the Safety Element of County General Plan.
2. El Dorado County is currently in the process of updating the defensible space ordinances.

Key

Auburn = City of Auburn
BLM = U.S. Department of the Interior, Bureau of Land Management
ED/PC = Counties of El Dorado and Placer
FSC = Fire Safe Councils
Placerville = City of Placerville
Tribes = Native American tribes, including Shingle Springs Band of Miwok Indians and United Auburn Indian Community
USFS = U.S. Department of Agriculture, Forest Service

4.5 RMS13 – Increase Community Capacity for Sustainable Management and Resilience to Major Disasters

Many resources are needed to implement the RMS identified for the upper American River watershed. These resources include adequate partner institutional and financial capacity, as well as commercial capacity, and a local workforce that can meet the needs of watershed management projects and activities.

RMS Actions	Principal Implementing Agencies
13a. Coordinate with counties, economic development interests, and the California Community College to develop workforce needs, curriculums, and programs to foster local workforce growth to support long-term sustainable watershed management.	ED/PC, EDWA, PCWA, USFS, BLM
13b. Perform a regional transportation needs assessment to support agricultural development consistent with the ED/PC General Plans that incorporates working landscapes, improves outdoor recreation access, expands broadband availability in rural-agricultural areas, and promotes safe egress of communities during wildfires and other emergencies.	ED/PC, FB, TC/PA, SMUD, PCWA
13c. Investigate the opportunities to create new, or expand existing, wood-utilization businesses within the watershed in collaboration with state and federal agencies.	ED/PC, COC
13d. Explore potential alternative funding mechanisms based on the findings from the ecosystem good and service valuation (RMS 9.1b) to support long-term sustainable RMS implementation.	ED/PC, EDWA, PCWA, RCD, EID
13e. Improve wildfire emergency response planning and the shared understanding of the roles and responsibilities of involved agencies and entities; and expand and share tools for wildfire recovery.	ED/PC, EDWA, EID, GDPUD, RCD, Placerville, Auburn, PCWA
13f. Determine water suppliers for areas within the ED/PC General Plans that are currently outside of service areas of any major water suppliers to ensure water resilience for planned development.	ED/PC, EDWA, PCWA, LAFCo

Key

Auburn = City of Auburn

BLM = U.S. Department of the Interior, Bureau of Land Management

COC = Chamber of Commerce, including El Dorado County COC, El Dorado Hills COC, Shingle Springs Cameron Park COC, Auburn California COC, Colfax California COC, and Foothill Divide Chamber

ED/PC = Counties of El Dorado and Placer

EDWA = El Dorado Water Agency

FB = Farm Bureaus, including El Dorado County Farm Bureau and Placer County Farm Bureau

FSC = Fire Safe Councils

GDPUD = Georgetown Divide Public Utility District

LAFCo = Local Agency Formation Commission, including El Dorado County LAFCo and Placer County LAFCo

PCWA = Placer County Water Agency

Placerville = City of Placerville

SMUD = Sacramento Municipal Utility District

TC/PA = Transportation Commissions and Planning Agencies, including El Dorado County Transportation Commission and Placer County Transportation Planning Agency

4.6 Complementary Water Resource-Focused Resource Management Strategies

Water is an important resource and benefit provided by the upper American River watershed. Reliable, clean, and affordable water supplies are critical to supporting healthy and productive ecosystems, local economies, and social values in the watershed's communities. In this context, water resources management is an essential element of sustainable watershed management, and consistent with the goals of the PWP. For this reason, the water resource-focused RMS listed in the following table are included in this PWP. These RMS were originally identified in EDWA's 2019 WRDMP and the numbering shown below are those used in the WRDMP. Only applicable RMS from the WRDMP are included; hence, numbering may not be sequential. Like the RMS described previously, these broad strategies contribute to a healthy and resilient watershed that provides beneficial EGS within and beyond its boundaries.

Complementary Water Resource-Focused Resource Management Strategies

RMS1 – Secure Surface Water Supply Entitlements	Principal Implementing Agencies
1b. Secure water rights for projected needs.	EDWA, EID, GDPUD, GFCSD, PCWA
1c. Develop water infrastructure to meet projected needs.	Placerville, Auburn, EDWA, EID, GDPUD, GFCSD, PCWA, ED/PC
1d. Manage and leverage Sacramento Municipal Utility District storage agreement.	EDWA
1e. Develop operational agreements as needed for flexible use of available water supplies.	Placerville, Auburn, EDWA, EID, GDPUD, GFCSD, PCWA, ED/PC

RMS2 – Develop and Implement Demand Management	Principal Implementing Agencies
2a. Review and update water use demands by incorporating land use policy and plans, regulatory changes, and best management practices.	Placerville, Auburn, PCWA, EDWA, EID, GDPUD, GFCSD
2b. Engage in the development of statewide long-term water conservation policies, regulations, and legislation to ensure applicability in foothill and mountain communities and protect interests of headwaters and rural counties.	Placerville, Auburn, ED/PC, EDWA, EID, GDPUD, GFCSD, PCWA

RMS3 – Implement Sustainable Groundwater Management	Principal Implementing Agencies
3b. Engage in the development of statewide sustainable groundwater management policies, regulations, and legislation to protect the interests of headwaters and rural mountain counties.	ED/PC, EDWA, PCWA
3c. Improve understanding of conditions and use of localized and shallow groundwater resources in foothills outside of the major groundwater basins.	ED/PC, EDWA, PCWA
3d. Improve understanding of the level of public health concerns and drought vulnerability associated with private wells that are not subject to management under a Groundwater Sustainability Agency.	ED/PC, EDWA, PCWA

Complementary Water Resource-Focused Resource Management Strategies (Continued)

RMS4 – Increase Water Reuse	Principal Implementing Agencies
4a. Explore potential for and implement potable reuse of treated wastewater	EDWA, EID, PCWA
4b. Increase non-potable reuse of treated wastewater onsite (e.g., truck washing facilities)	ED/PC in coordination with facility owners
4c. Increase non-potable reuse of treated wastewater for instream flow augmentation	ED/PC or other interest groups in coordination with willing facility owners if not part of regulatory requirements.
4d. Encourage greywater reuse and rainfall harvest practices on household and individual facility level	ED/PC, Placerville, Auburn, EID, GDPUD, GFCSD, PCWA, EDWA

RMS5 – Secure Water Infrastructure	Principal Implementing Agencies
5a. Ensure water infrastructure integrity, operations, and maintenance through water agency-specific Capital Improvement Programs.	Placerville, Auburn, EID, GDPUD, GFCSD, PCWA
5b. Develop new high-elevation storage to replace lost snowpack and increase water supply reliability.	ED/PC, EDWA
5c. Reduce vulnerability of water infrastructure to large-scale wildfires.	EID, GDPUD, GFCSD, PCWA, Placerville, Auburn
5d. Update water infrastructure emergency response and communication plans regularly to keep current, including the threat of wildfire and potentially extended power shutoffs.	EID, GDPUD, GFCSD, PCWA, Placerville, Auburn

RMS7 – Improve Drought Preparedness and Response	Principal Implementing Agencies
7a. Expand drought planning for urban water suppliers per Assembly Bill 1668/Senate Bill 606.	EDWA, EID, GDPUD, PCWA
7b. Include droughts as a hazard in the County's Multi-Jurisdictional Hazard Mitigation Plan for emergency response coordination and potential future FEMA assistance.	ED/PC
7c. Conduct vulnerability assessments for small water systems and rural communities.	ED/PC, EDWA
7d. Establish a County Drought and Water Shortage Task Force and develop a County Drought Resilience Plan for addressing drought vulnerability for small public water systems and rural communities per Senate Bill 552.	ED/PC, EDWA
7e. Develop a Regional Drought Contingency Plan to coordinate and align all agency-specific drought plans and related response and mitigation actions.	ED/PC, EDWA, EID, GDPUD, GFCSD, PCWA

Complementary Water Resource-Focused Resource Management Strategies (Continued)

RMS8 – Ensure All Residents have Access to Clean and Affordable Water	Principal Implementing Agencies
8a. Assess countywide challenges in water accessibility and affordability (Human Right to Water, California Water Code Section 106.3).	ED/PC, EDWA, Placerville, Auburn, EID, GDPUD, GFCSD, PCWA
8b. Participate in statewide efforts to develop policy, regulations, and legislation related to water affordability that are workable for communities in headwaters and mountain counties.	ED/PC, EDWA, Placerville, Auburn, EID, GDPUD, GFCSD, PCWA

RMS10 – Prevent Contamination of Surface Water and Groundwater Resources	Principal Implementing Agencies
10a. Explore and apply advanced technologies for water quality monitoring (surface water and groundwater), including remote sensing, for areas susceptible to water quality problems.	ED/PC, EID, PCWA, EDWA
10b. Implement Sewage System Management Plans in coordination with system owners, including emergency response protocols and vulnerability assessments.	ED/PC, Placerville, Auburn, EID, GDPUD, PCWA
10c. Implement the Nutrient Management Plan for agricultural practice to reduce the risk of long-term effects on the quality of surface water and groundwater resources.	ED/PC, FB
10d. Implement County Local Agency Management Plan for Onsite Wastewater Treatment Systems, including enforcement of guidelines for approval and repairs.	ED/PC
10e. Conduct public outreach and education activities to encourage prevention of water supply contamination.	ED/PC, Placerville
10f. Inspect permitted septic tank systems.	ED/PC, GDPUD[1]

Note: 1. GDPUD manages the Auburn Lake Trails Wastewater Zone.

Key

Auburn = City of Auburn
ED/PC = Counties of El Dorado and Placer
EDWA = El Dorado Water Agency
EID = El Dorado Irrigation District
FB = Farm Bureaus, including El Dorado County Farm Bureau and Placer County Farm Bureau
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District
LAFCo = Local Agency Formation Commission, including El Dorado County LAFCo and Placer County LAFCo
PCWA = Placer County Water Agency
Placerville = City of Placerville

5

Prioritized Projects

The RMS presented in Chapter 4 are broad, long-term management strategies that, when properly identified, remain applicable over time. The management actions supporting specific RMS are also generally described to include multiple projects or phases of development and implementation. Specific project formulation will be affected by the partnering agencies and their associated authorities, funding availability, mutual leveraging opportunities, and other factors ranging from institutional to practical considerations of implementability. As watershed conditions are dynamic, so should be the projects identified to address them.

This chapter presents the evaluation and prioritization of the initial projects identified during the PWP development process. For this first PWP, the initial project identification, evaluation, and resulting prioritization were based on existing available information compiled based on review of relevant plans and programs, and contributions from the UARWG partners.

The UARWG conducted the project evaluation in this first PWP process to provide needed feedback to project proponents to further improve their projects for early implementation and broad benefits to the watershed. The adopted evaluation approach provides a durable structure of evaluation criteria for project evaluation for future consistent applications and includes sufficient flexibility in metric use for necessary customization to address preferences imposed by funding opportunities and where applicable, adjustments to improve the overall outcome based on the stage of PWP implementation and changed conditions identified by the UARWG partners.

5.1 Project Identification

A total of 191 initial projects were compiled through partner contribution and a review of existing available information from ongoing and recently completed watershed or regional programs and plans. For this initial evaluation process, the projects are classified into four categories based on their stage of development and potential effects on the physical environment:

- **Conceptual Projects** that are in the early conceptualizing phase with limited details to evaluate or determine their viability or potential accomplishments.
- **Planning Projects** that have sufficient details to evaluate and are within the planning, design, environmental review for project approval, and if applicable, permit acquisition phases.
- **Implementation Projects** that have received necessary approval(s) for implementation, including but not limited to, construction and similar projects with direct effects on the physical environment.
- **Institutional Projects** that improve education, organizational practices, programs and training, standards of practice, and regulatory approaches related to watershed management or community resilience, but have no direct effect on the physical environment in the watershed.

Consultation with project proponents and reconciliation of project information were conducted to improve basic understanding of the projects. Based on the available project information, these projects were also assigned one of the following categories: capital improvement projects, data collection and development, education and information sharing, environmental projects, hazard mitigation, and regulatory or policy development. However, despite this process, projects had varying levels of details related to objectives, proponent(s), description, and anticipated outcomes. Additional efforts by partners will need to be continued during PWP implementation to improve project formulation and documentation.

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5.2 Project Evaluation

Each project was evaluated for its potential accomplishments in four areas that are commonly used for evaluating resource management projects and actions, especially for potential state and federal financial support:

- **Effectiveness:** Assessing the potential accomplishments of each project to restore or enhance social, natural, and/or built capacities within the watershed.
- **Efficiency:** Assessing the potential cost efficiency of each project to achieve what it was set to do in alleviating identified watershed challenges and realizing the applicable RMS.
- **Acceptability:** Assessing the potential level of support from local, regional, state, and federal agencies and entities, including consistency with existing laws, authorities, and policies.
- **Completeness:** Assessing the potential dependency of each project on actions by others for implementation, including external funding and approval needs by those other than project proponents, and associated confidence and readiness of project implementation.

This project evaluation was only performed on a qualitative basis due to the varying levels of project information available even though some projects may have had sufficient information for a qualitative evaluation. To the extent possible, the qualitative evaluation relies on the available project objectives, scope, anticipated outcomes on timing and geographical coverage, and where available, costs and other detailed information.

Furthermore, the UARWG recognized the following principles for project evaluation:

- No single project is expected to cover all aspects needed to improve the upper American River watershed; rather, the potential accomplishments of each project were evaluated based on its own objectives, scope, and anticipated outcomes against the RMS outlined in this PWP.
- The evaluation criteria should incorporate metrics addressing the trend of recent federal and state financial assistance programs that favor shovel-ready, on-the-ground implementation projects, multi-benefit projects with active climate adaptation on a regional level and demonstrated broad support for regional implementation.
- The evaluation criteria should facilitate short-term and long-term complementary actions that provide timely near-term relief and long-term mitigation.
- These four evaluation criteria are considered equally important for project evaluation at this stage of the watershed plan development. Where appropriate, additional metrics comparable to the level of information available were developed to help differentiate projects in a qualitative and relative manner, but did not change the preferences or priorities among the four evaluation criteria.

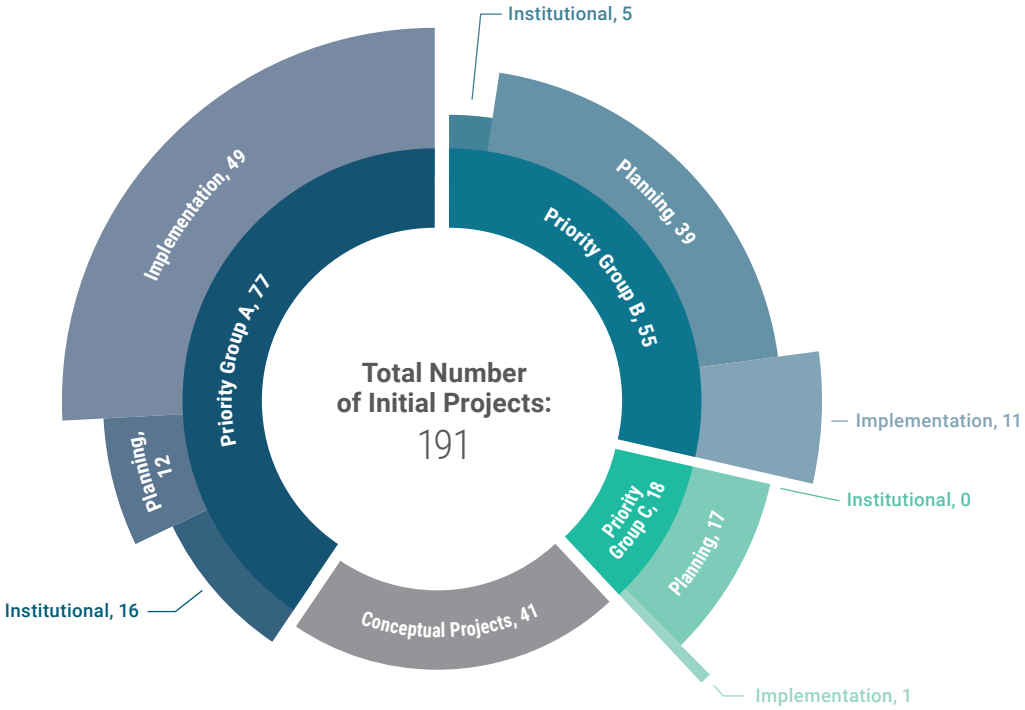
The prioritization of initial projects is based on qualitative evaluation of potential project accomplishments compared against the goals of this Programmatic Watershed Plan and identified resource management strategies. The four major criteria are standard and durable for evaluating resource management projects for investment decisions. Metrics within each major criterion can be customized to fit specific needs or funding requirements.

5.3 Prioritized Projects

Among the identified 191 projects, a total of 150 planning, implementation, and institutional projects were evaluated for their potential contribution to sustainable watershed management and community resilience. The 41 conceptual projects were not evaluated for prioritization purposes due to their early stage of development and lack of sufficient information for meaningful evaluation. Additional details of these projects and their corresponding prioritization are provided in the Appendix.

In summary, the 150 projects were prioritized into three groups of prioritization (A, B, and C) to represent the corresponding order of priority. As previously mentioned, the processes of project evaluation and prioritization for this initial PWP will help partners improve and develop future project concepts, partnerships, scopes, and implementation considerations. The list of initial projects and their current priorities are considered a snapshot in time, and the partners of the UARWG can revise and reevaluate potential project accomplishments by incorporating additional criteria customized for unique considerations or funding opportunities.

The prioritization of initial projects suggests Group A has the most implementation projects, and Group B has the most planning projects. This provides a continued feed of projects for watershed improvements.



6

Implementation

Implementation of this PWP requires collaborative and coordinated actions by individual partners that conform with their corresponding authority, priority of investment, and approval by their governing board, council or equivalent. This chapter describes necessary considerations for partners to implement the identified RMS and associated management actions in Chapter 4 and prioritized projects in Chapter 5 where appropriate.

6.1 Balanced Individual Autonomy Amidst Collective Implementation

As described in Chapter 1, the goal of the PWP is to establish a cohesive and shared vision for sustainably managing the upper American River watershed for long-term resilience and community prosperity. The collaboration that occurred to develop this PWP among local, regional, state, Tribes, and federal partners is helping to foster the necessary support for implementation.

The RMS identified in the PWP provide collectively-supported policy direction and their associated management actions may consist of multiple projects or phases of implementation. It is anticipated that individual partners will, based on the PWP, seek additional policy guidance from their governing board, council, or equivalent to continue their collaboration in a way that aligns with their roles and responsibilities in the watershed. Where applicable, individuals' additional policy guidance could include project formulation, implementation requirements, and principles of partnership and engagement. These policies and guidance, as well as their financial conditions and investment priority, may further refine the details for implementing these management actions. At the same time, individual partners can also rely on broad support from other partners in the watershed when seeking financial and technical assistances from federal and state governments, or approval and implementation of covered management actions and projects consistent with the PWP.

6.2 Performance Measures and Updates of the Programmatic Watershed Plan

The UARWG recognizes the potential of a fast-changing future in watershed management due to landscape-scale disasters and continued manifestation of climate change effects. This PWP is a living document that will be subject to periodic reviews for changed conditions and incorporation of necessary adjustments in management actions and priorities based on implementation outcomes and lessons learned.

The conditions, needs, and implementation of solutions in the upper American River watershed are highly dynamic. Each implementation action may have consequences in the many connected resource management issues and affect demographic groups and geographic locations differently. Therefore, the UARWG agreed that performance measures are necessary to evaluate the outcomes from implementation toward the desired outcomes of the PWP. When designed with proper considerations of data and information availability and transparency, these measurements will provide valuable input for further improvement of the PWP and refinements of identified RMS and management actions. They can also help identify the potential unmet needs or areas with less progress that may warrant adjustments of policy and practices. As such, the UARWG considered developing performance measures as a focused area for continued collaboration and next update of the PWP.

There are other factors that may also warrant an update. These include major changed watershed conditions and regulatory environment, significant progress in implementation, and critical accomplishments in watershed understanding, technology, data, and information acquisition. All of these factors may trigger revisions to the current RMS and associated management actions, as well as the expansion of PWP partnership for innovation.

The Upper American River Watershed Group positioned the Programmatic Watershed Plan on a predominantly strategic level to establish the basis for federal and state engagement and advocacy, and to provide policy direction to regional and location-specific planning efforts in a cohesive and coordinated manner.

This infographic was adapted from the original version in 2022 Flood Management Funding Essentials by California Department of Water Resources.

Based on the above consideration, the UARWG prepared the PWP in a concise and structured format that facilitates streamlined updates and communication. The resulting policy plan provides stable guidance for all watershed managers and interested parties to channel concerted energy toward continued collaboration and desired outcomes.

The UARWG further determined that the PWP is subject to an update every 5 years, in the years ending in 3 and 8. A 5-year cycle is common for strategic policy plans like the PWP to allow sufficient time for program and project development, approval, and implementation. Additional supplemental products and communications may also be developed to provide timely feedback and celebration of success while minimizing administrative burdens for all participating partners. Where appropriate, special communication for showcasing specific projects and actions may be developed to foster the spirit of continued collaboration.

6.3 Continued Collaboration for Watershed Future

The spirit of collaboration and anticipated collective implementation requires all partners to exercise their authority and capacity to create innovative and progressive opportunities to advance the goals and RMS outlined in this PWP. It is anticipated that all UARWG partners will continue advocating for this shared vision and actively developing collaborative and equitable partnership within and beyond the upper American River watershed to support PWP implementation.

Additional engagement and recruitment of new partners with policy, financial, or technological advantages and functional working groups within the watershed are encouraged. The high level of collaboration and cooperation will help deploy all available, proven science- and evidence-based solutions to battle our climate crisis and improve opportunities for our watershed future.

The continued collaboration among the UARWG partners will rely on the efficient and streamlined structure EDWA established for this PWP development. The UARWG is a collaborative group established under the Plenary. The Plenary was formed in 2001 under the direction of EDWA's Board of Directors to be a standing forum for consistent and proactive communication and engagement with the public and interested parties to promote transparency and constructive dialogue among countywide and regional partners to advance water resource management in EDC and beyond. The standing status of the Plenary and thus, the UARWG, provides necessary assurance for the participating partners. The Plenary also provides an additional pathway of communication to advocate for and collaborate on watershed management. EDWA committed to serving as the convener for the UARWG to facilitate continued development and implementation of the PWP.

A

Appendix: Prioritized Initial Projects

Programmatic Watershed Plan Prioritized Initial Projects

Project Name	Project Type	Project Proponent	Group
Caldor Tribal Native Plant Restoration Project	Implementation	USFS, Shingle Springs Rancheria	A
Caldor Emergency Forest Restoration Team Fuels Reduction	Implementation	El Dorado RCD, EDC, EDWA	A
California Conservation Corps Forest Wide Fuels Reduction	Implementation	USFS, California Conservation Corps	A
King Fire Site Prep and Biomass Utilization	Implementation	USFS, SNC	A
Caldor Fire Restoration, Reforestation, and Recovery Studies	Institutional	USFS, American Forests	A
El Dorado Water Agency's Online Mapping and Data Portal	Institutional	EDWA, EDC	A
Tahoe Central Sierra Initiative - Greenstone Fuels Reduction	Implementation	El Dorado RCD, EDWA	A
American River Headwaters Forest Restoration	Implementation	ARC, USFS, PCWA, SNC, UC Merced, TNC	A
Splash in the Class - Outreach Program	Institutional	EDC	A
Best Management Practices for Agricultural Erosion and Sediment Control Manual	Institutional	EDC	A
Wakamatsu Farm Native Plant Educational Initiative	Institutional	ARC, UAIC	A
Sierra Springs Fuel Break	Implementation	El Dorado RCD, Sierra Springs Regional FSC	A
Caldor Fire Restoration and Reforestation Stewardship	Implementation	USFS, EDC	A
Caldor Fire Noxious Weed Control and Reforestation	Implementation	USFS, GBI	A
American Conservation Experience Caldor Fire Trails Recovery (Motorized and Non-Motorized)	Implementation	USFS, ACE	A
Post King Fire 13-mile Rubicon River Restoration	Implementation	USFS, Placer RCD	A
Upper Consumnes River Watershed Oak Woodland and Riparian Habitat Protection	Implementation	ARC	A
Georgetown Fuel Break	Implementation	Georgetown Divide RCD, EDWA	A
King Fire Restoration and Reforestation Projects	Planning	USFS, American Forests	A
Long Canyon Forest Restoration Project	Implementation	PCWA, USFS	A

Programmatic Watershed Plan Prioritized Initial Projects (Continued)

Project Name	Project Type	Project Proponent	Group
Sly Park Recreation Area Shoreline Stabilization	Implementation	EID	A
Cameron Park Drainage Improvements	Planning	EDC, EDWA, CPCSD	A
Campground Improvements at French Meadows, Hell Hole and Big Meadows, Coyote Group, Upper Hell Hole, Poppy, and Lewis Campgrounds	Planning	USFS, PCWA	A
Upper Mokelumne River Watershed Authority Forest Project Plan Phase I	Planning	USFS, Upper Mokelumne River Watershed Authority	A
Tobacco Gulch Ecological Restoration	Planning	USFS, SNC	A
French Meadows Forest Restoration Project	Implementation	PCWA, USFS, PC, TNC, SNC, ARC, UC Merced	A
Hell Hole Dam Seasonal Storage	Implementation	PCWA	A
American River Conservancy Land Stewardship Program	Institutional	ARC	A
Indian Bar River Access	Implementation	PCWA	A
French Meadows Boat Ramp Extension and Picnic Area	Implementation	PCWA	A
Crystal Basin - Reservoir Forest Health Project	Implementation	USFS	A
El Dorado Canal Fuel Break Project	Implementation	EID, EDC, EDWA, USFS	A
Caldor Fire National Environmental Policy Act Compliance Assistance, Fuels Management and Removal, Forest Health Restoration and Recovery	Implementation	USFS, GBI	A
Pulak Educational Center Native Plant Nursery	Institutional	El Dorado RCD	A
Fish and Wildlife Routine Maintenance Agreement	Institutional	EDC, USFWS	A
Cedar Ravine Road Drainage Improvement	Planning	Placerville, Caltrans	A
Grizzly Flats Watershed Restoration Projects	Planning	El Dorado RCD, USFS, EDWA	A
Cosumnes River Education Center	Institutional	EDC	A
Mosquito Fuels Reduction	Implementation	Georgetown Divide RCD, EDWA	A
Blacksmith Fuels Reduction and Biomass Utilization	Implementation	USFS, SNC	A

Programmatic Watershed Plan Prioritized Initial Projects (Continued)

Project Name	Project Type	Project Proponent	Group
Revenant Fuel Reduction and Biomass Utilization	Implementation	USFS, SNC	A
Patterson Fuels Reduction	Implementation	El Dorado RCD, EDWA	A
Crystal King Restoration Partnership Project	Implementation	USFS, GBI	A
Amador Ranger District Callecat and Foster Firs Roadside Fuels Reduction	Implementation	USFS, California Deer Association	A
Calaveras Healthy Impact Product Solutions Highway 88 Fuels Reduction	Implementation	USFS, Calaveras Healthy Impact Product Solutions	A
Garden Valley /Kelsey Roadside Fuels Reduction	Implementation	USFS, Georgetown Divide FSC	A
Jenkinson Lake Fuels Reduction	Implementation	USFS, El Dorado RCD, Mule Deer Foundation, EID	A
Stormwater Detention Basin - Hangtown Creek Flood Damage Reduction Project	Planning	Placerville, EDC	A
Silver Lake Dam Replacement	Implementation	EID	A
French Meadows Forest Management Water Balance Investigation	Implementation	PCWA, USFS, UC Merced	A
American River Conservancy Recreational Trail System on Salmon Falls Ranch	Implementation	ARC, FATRAC, MLTS	A
Georgetown Ranger District Fuels Reduction Project	Implementation	USFS, SNC	A
Twofer-Pilliken Fuels Reduction	Implementation	USFS, SNC	A
John Don't Fuels Reduction	Implementation	USFS, SMUD	A
Foresthill Public Utility District Website Rebuild	Institutional	FPUD	A
Leek Springs Meadow Restoration Project	Planning	ARC, CDFW, EDWA	A
Wilsons Meadow Calf Pasture Stream Restoration and Fuel Reduction	Planning	USFS, American Rivers	A
Countywide Stormwater Asset Management Program	Institutional	EDC	A
Middle Fork Interbay Outlet Works Upgrade	Implementation	PCWA	A
French Meadows North Shore Water Supply	Implementation	PCWA	A

Programmatic Watershed Plan Prioritized Initial Projects (Continued)

Project Name	Project Type	Project Proponent	Group
North Fork Long Canyon Diversion Upgrade	Implementation	PCWA	A
South Fork Long Canyon Diversion Upgrade	Implementation	PCWA	A
Canal Reliability Improvement Projects	Implementation	GDPUD	A
General Sherman Fuels Reduction	Implementation	USFS	A
General Sherman Integrated Resource Timber Contract - Timber Sale	Implementation	USFS	A
Pack Saddle Fuels Reduction	Implementation	USFS	A
Forgotten Flat Fuels Reduction	Implementation	USFS	A
Cosumnes River Water Quality Monitoring Program	Institutional	ARC	A
County Wide Water Quality Monitoring	Institutional	EDC	A
American River Conservancy Education Programs	Institutional	ARC	A
Irrigation Efficiencies Incentives for Schools (formerly ET Smart Controller Program)	Institutional	PCWA	A
North Fork American River Pumping Plant Evaluation	Planning	GDPUD	A
Two-fer Integrated Resource Timber Contract-Timber Sale	Planning	USFS	A
Onion Creek Diversion Repair	Implementation	GDPUD	A
Duncan Creek Diversion Dam Upgrade	Implementation	PCWA	A
Auxiliary Backup Power Supply at American River Pump Station	Implementation	PCWA	A
Canal Street Low Impact Development Projects	Planning	Placerville	A
Modification of Water Right Permit 21112	Institutional	EID	A
Grizzly Flats, Gold Ridge, and Sierra Springs Vegetation Management	Planning	El Dorado RCD, EDC FSC	B
Cosumnes River Recreational Trail	Planning	ARC, CDFW, EDC, Caltrans, El Dorado CNPS	B

Programmatic Watershed Plan Prioritized Initial Projects (Continued)

Project Name	Project Type	Project Proponent	Group
Eldorado National Forest and Lake Tahoe Basin Management Unit Fuels Reduction and Biomass Removal	Implementation	USFS, GBI	B
Revenant Georgetown: Quinette and Vulcan Fuels Management and Biomass Removal	Implementation	USFS, The Mule Deer Foundation	B
Amador County Fuels Reduction and Hazardous Tree Removal	Implementation	USFS, County of Amador	B
Todd's Valley Fire Fighting Water Supply Tank	Planning	FPUD	B
Volcanoville Fuels Management	Planning	Georgetown Divide RCD, EDC, FSC	B
Wrights Lake Recreation Area Fuels Reduction Project	Planning	El Dorado RCD	B
O'leary Cow Integrated Resource Service Contract/ Integrated Resource Timber Contract-Timber Sale & Thinning Project	Planning	USFS, EDC, SMUD	B
Ice House and Union Valley Reservoir Thinning Integrated Resource Timber Contract	Planning	USFS	B
Expansion of Current Conservation through Advanced Metering Infrastructure (AMI)	Institutional	PCWA	B
Hell Hole Dam Outlet Works Upgrade	Implementation	PCWA	B
Our Water Our World - Outreach Program	Institutional	EDC	B
Union Mine Landfill Retention Ponds	Planning	EDC	B
Tobacco Gulch Integrated Resource Timber Contract-Timber Sale and Thinning Project	Planning	USFS	B
Quintette Integrated Resource Timber Contract Supplemental Information Report - Timber Sale	Planning	USFS	B
Trestle Integrated Resource Timber Contract - Timber Sale	Planning	USFS	B
Middle Creek Integrated Resource Timber Contract-Timber Sale & Fuels Reduction Project	Planning	USFS	B
Western Georgetown Fuel Reduction Integrated Resource Timber Contract – Timber Sale	Planning	USFS	B
Fairgrounds Water Quality Improvements	Planning	EDC	B
Stumpy Meadows Reservoir Storage and Diversion Project	Implementation	GDPUD	B
Station 16 Community Disposal System Lift Station Upgrade	Implementation	GDPUD	B

Programmatic Watershed Plan Prioritized Initial Projects (Continued)

Project Name	Project Type	Project Proponent	Group
Countywide Water Quality Awareness Campaign	Institutional	EDC	B
Fred's Noxious Weed Treatment-Vegetation Management	Planning	USFS	B
Middle Fork Interbay Sediment Removal	Implementation	PCWA	B
Ralston Afterbay Sediment Removal and Access Point Improvement	Implementation	PCWA	B
Advanced Metering Infrastructure	Implementation	GDPUD	B
Georgetown Insect Salvage Timber Sale	Planning	USFS	B
County Water Quality Standards Improvement Project	Institutional	EDC	B
Hell Hole Recreation Work Station & Storage Facility for USFS	Planning	PCWA, USFS	B
Applegate to Colfax Area Water Regionalization Consolidation Planning	Planning	PCWA	B
American River Conservancy Public Programs	Institutional	ARC	B
Water Wheel Projects	Planning	GDPUD	B
Sweetwater Treatment Plant Storage Tank Installation	Planning	GDPUD	B
American River Pump Station Intake #6 Repair and other Repair and Rehabilitation	Planning	PCWA	B
McGuire Picnic Area Conversion to Group Campground	Planning	PCWA	B
Erosion Management Plan	Planning	PCWA	B
Chili Bar Park Storm Damage Repair	Planning	ARC	B
Cleveland-Ice House Forest Health Project	Planning	USFS	B
American River Conservancy River Cleanups	Implementation	ARC	B
Middle Fork Project Power Pole Upgrades	Implementation	PCWA	B
Poppy Campground & Trail	Planning	PCWA	B

Programmatic Watershed Plan Prioritized Initial Projects (Continued)

Project Name	Project Type	Project Proponent	Group
Walton Surface Water Treatment Plant Solar Installation	Planning	GDPUD	B
French Meadows South Shore Water Supply	Planning	PCWA	B
Applegate Tank Replacement	Planning	PCWA	B
Loon Lake Conveyance	Planning	GDPUD	B
Canyon Creek Bypass Pipeline	Planning	PCWA	B
French Meadows Landscape Rehabilitation Project	Planning	PCWA	B
East Weimar Cross Road Loop Water Supply Project	Planning	PCWA	B
Foresthill Hardrock Lane Pressure Reducing Station Replacement	Planning	FPUD	B
Large Woody Debris Management Project	Planning	PCWA	B
El Dorado Canal and Flume Replacement Program	Planning	EID	B
Sly Park Intertie Improvements Project	Planning	EID	B
Tank Replacement Projects	Planning	EID	B
Culvert Rehabilitation along Highway 50 near Cameron Park and Shingle Springs	Planning	Caltrans	C
Transportation System Management Plan	Planning	PCWA	C
Regional Water System Reliability and Conservation Project – Canal Lining	Planning	PCWA	C
Hell Hole Support Facilities Water Supply	Planning	PCWA	C
Hell Hole Parking Improvements	Planning	PCWA	C
Hell Hole Boat Ramp Extension	Planning	PCWA	C
Stumpy Outlet/Wheel for Spillway	Planning	GDPUD	C
Canyon Creek Bypass Pipeline	Planning	PCWA	C

Programmatic Watershed Plan Prioritized Initial Projects (Continued)

Project Name	Project Type	Project Proponent	Group
Station 16 Solar Installation	Planning	GDPUD	C
Distribution Meters - Bowman and Applegate Water Treatment Plant	Institutional	PCWA	C
Middle Fork Stream Gage Trail Improvements	Planning	PCWA	C
Community Disposal System Fields Wastewater Treatment Plant	Planning	GDPUD	C
Walton Greenwood Reservoir Dredging	Implementation	GDPUD	C
Airport Road/Broadway Culvert Storm Drain Improvement	Planning	EDC	C
French Meadows RV Dump Station	Planning	PCWA	C
Afterbay Picnic Area	Planning	PCWA	C
Middle Fork Project Facility Painting - Visual Resource Management Plan	Planning	PCWA	C
Spawning Habitat Improvement Project	Planning	PCWA	C

Key

ACE = American Conservation Experience
ARC = American River Conservancy
BLM = U.S. Department of the Interior, Bureau of Land Management
CAL FIRE = California Department of Forestry and Fire Protection
Caltrans= California Department of Transportation
CDFW = California Department of Fish and Wildlife
CNPS = California Native Plant Society
CPCSD = Cameron Park Community Services District
County = County of El Dorado
EDC = County of El Dorado
EDWA = El Dorado Water Agency
EID = El Dorado Irrigation District
FATRAC = Folsom Auburn Trail Riders Action Coalition
FPUD = Foresthill Public Utility District
FSC = Fire Safe Councils
GBI = Great Basin Institute
GDPUD = Georgetown Divide Public Utility District
GFCSD = Grizzly Flats Community Services District
MLTS = Mother Lode Trail Stewardship
PC = County of Placer
PCWA = Placer County Water Agency
Placerville = City of Placerville
RCD = Resource Conservation District
SPI = Sierra Pacific Industries
SMUD = Sacramento Municipal Utility District
SNC = Sierra Nevada Conservancy
SOFAR = South Fork American River Cohesive Strategy
TNC = The Nature Conservancy
UAIC = United Auburn Indian Community
UC = University of California
USFS = U.S. Department of Agriculture, Forest Service

Upper American River Watershed Group

Programmatic Watershed Plan

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El Dorado Water Agency

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