Chapter 6

Adaptation Strategies, Actions, and Implementation Roadmaps

This chapter lays out the core strategies and actionable steps needed to build climate resilience across the watershed. It provides coordinated, multi-benefit actions spanning water supply, flood management, ecosystems, cultural resources, governance, and equity.

Introduction

This chapter provides an interrelated and implementation-focused set of climate adaptation strategies and actions that address the watershed's key climate vulnerabilities (identified in **Chapter 4**) and reflect community insights and priorities gathered throughout the VRWRP process. These strategies and actions offer direction on how the watershed can reduce risk, strengthen resilience, and protect communities, ecosystems, and infrastructure as climate hazards intensify.

The strategies and actions were developed through an iterative and collaborative process that reflect technical assessment results, watershed conditions, climate-hazard projections, equity considerations, and sustained engagement with local agencies, Tribes, community-based organizations, and other watershed partners and members. While the full suite of strategies and actions contribute to watershed resilience, a subset of actions was selected for the development of Implementation Roadmaps because they are especially complex, cross jurisdictional, and require sustained coordination among multiple partners. Implementation Roadmaps provide more guidance on leadership roles, funding considerations, and practical next steps to support effective coordination and implementation.

Approach

Adaption strategies and actions are organized under eight goal areas that structure the implementation framework for the VRWRP. The adaptation strategies and actions within each goal work together to reduce risk and deliver multiple benefits across water and groundwater supply reliability, water quality and ecosystem protection, flood and wildfire risk reduction, and protection and enhancement of agricultural lands, recreation, and Tribal resources. The goals envision a watershed that is resilient to climate hazards in recognition of the interconnected nature of the Ventura River system, where a myriad of components are closely linked, like the dynamic relationships between wildfire, extreme precipitation, sediment transport, and surface water diversions. This chapter describes the hazards addressed by each strategy, anticipated equity and co-benefits, and tracking metrics to measure performance of the strategy as actions are implemented.

Within each of the eight goals, one action was selected for more detailed implementation consideration based on its complexity and need for collaboration. These selected actions address multiple vulnerabilities simultaneously, and received strong support during VRWRP engagement events, including Advisory Group meetings and public watershed forums. For each selected action, an Implementation Roadmap provides clear steps, leadership roles, funding opportunities, performance metrics, and examples of existing efforts that can be leveraged to advance the action.

Methodology

The climate adaptation strategies and actions were identified through a stepwise process that combined technical analysis, review of existing efforts, and community- and water resource-specific engagement. The intent of this approach was to strengthen and build on initiatives already underway across the watershed, while also identifying and addressing gaps through new or enhanced strategies and actions. Each strategy is intentionally designed to align with and complement existing planning frameworks, capital programs, restoration initiatives, and operational practices led by water agencies, land managers, Tribes, and community partners in the watershed. Strategies were further refined through iterative Advisory Group discussions, with feedback serving a formative role in shaping priorities, sequencing, and implementation pathways. Tribal partners co-developed select actions, particularly those related to

cultural resources, stewardship, and land management. In addition, forum-based voting and facilitated dialogue directly informed roadmap selection and helped identify actions with cross-sector support.

The following steps summarize the methodology used to develop the VRWRP adaptation strategies and actions.

1. Vulnerability and Risk Assessment

Findings from the qualitative climate vulnerability assessments (**Chapter 4**) provided the foundation for initial adaptation strategy development. The watershed's most pressing vulnerabilities across climate hazards, water-resource system assets and features, and communities shaped the initial strategies. Particular attention was given to cross-cutting challenges such as the compounding effects of wildfire and post-fire flooding and debris flows; sediment impacts on reservoirs, diversions, and habitat; aging and exposed water infrastructure; water-quality degradation following extreme events; and uneven adaptive capacity among rural, Tribal, and wildfire-prone communities. These interconnected vulnerabilities informed strategies designed to address multiple risks simultaneously and emphasize upstream–downstream coordination.

2. Existing Adaptation Projects and Strategies

More than 40 relevant plans, studies, policies, and implemented or proposed projects within the watershed and surrounding region were reviewed as part of strategy development. This review included efforts related to water use efficiency, flood management and debris control, wildfire preparedness and post-fire recovery, surface- and groundwater-management, ecosystem restoration, land-use planning, and community capacity-building. **Understanding the breadth of existing initiatives ensured that new strategies build upon, rather than duplicate or undermine, ongoing work.**

3. Climate Adaptation Gaps Assessment

Existing projects and programs were evaluated to understand where current efforts may not fully address the present and future climate risks identified in the vulnerability and risk assessment. The review of gaps in current adaptation strategies identified limitations related to geographic coverage, the scale and timing of interventions, coordination across water-supply, flood-management, and land-use systems, and long-term operations and maintenance capacity. The review documented how existing efforts already address climate hazards, while also identifying where efforts are fragmented, geographically uneven, or may be insufficiently scaled for future conditions. These findings directly shaped the refinement of existing strategies and actions and the development of new ones.

4. Community and Sector-Specific Input

Adaptation strategies and actions were reviewed and refined with input from the VRWRP Advisory Group (AG), public watershed forum participants, and key watershed partners. Tribal partners from the Native Coast Action Network (NCAN) and the Barbareño/Ventureño Band of Mission Indians (BVBMI) led the development of strategies and actions focused on cultural resources, and contributed perspectives on equity, access to resources, stewardship priorities, and culturally significant landscapes across strategies. This input helped validate the vulnerability assessment with lived experience and operational realities, identify feasible adaptation measures, and ensure that strategies reflect local knowledge and on-the-ground capacity. Note, engagement occurred iteratively throughout the process and in each step of development; this step summarizes a single major point of review and refinement.

5. Screening Criteria

Adaptation strategies and actions were screened using criteria refined through (AG) engagement. These criteria were applied iteratively to ensure that proposed strategies and actions are both technically sound and responsive to community needs. This process resulted in a final set of strategies and actions that are risk-informed, gap-responsive, and structured to support near- and long-term implementation.

6. Implementation Roadmaps

After the final set of strategies and actions was identified, a subset of actions was selected for the development of Implementation Roadmaps. These actions were selected by applying the prioritization criteria (also refined through AG engagement) and through a voting exercise conducted during an in-person watershed forum, during which participants voted on which actions should receive expanded implementation guidance due to their complex or collaborative nature.

Screening Criteria

- Achieve VRWRP Vision, and Goals
- Reduce Risk to Communities
- Improve Performance of Water Resource System Infrastructure
- Does Not Cause Harm to Overburdened Communities
- Technical Feasibility
- Address Acute or Chronic Issues

Prioritization Criteria

- Cost and Benefits
- Funding Availability
- Regulatory / Permitting Complexity
- Political / Policy Feasibility
- Committed Leadership
- Achieve Equitable Outcomes
- Achieve Multiple Benefits
- Adaptable to Climate Uncertainty

Adaptation Strategies and Actions

In the sections that follow, each strategy advances specific actions, which presented with a clear, an overview of which climate hazards each strategy responds to, how implementation can be tracked and measured, and what equity and co-benefits it provides. Each action is then detailed in tabular form, outlining its implementation timeframe, lead and partner agencies, project scale, type of action, and the water-resource systems affected. Actions are categorized by both scale (asset-level to watershed-wide) and type (governance, funding, projects, operations, studies, and programs) to clarify who leads implementation, where change occurs, and how actions function within the broader resilience portfolio (see Figure 42 for an overview). This framework also distinguishes short- and long-term timeframes (roughly 0-7 years and 7+ years, respectively), helping partners sequence near-term capacity-building efforts alongside longer-term capital and ecosystem investments. While each action is organized within a primary category, many span multiple scales and types.

Although this chapter outlines a comprehensive set of strategies and actions, the VRWRP does not include cost information or cost estimates for all actions. Given the complex and multi-faceted and uncertain nature of the proposed adaptation strategies and actions, it was not feasible to include a full cost analysis but will be developed during implementation, when project scale and design are more defined. The Implementation Roadmaps do incorporate preliminary funding considerations (i.e. potential sources or mechanisms for funding) for a subset of priority actions, and a key next step in advancing the VRWRP will be to extend similar cost and funding assessments to the remaining actions.

To help provide context on potential order-of-magnitude costs, recent proposals and implementation experience in the watershed offer illustrative benchmarks. For example, Ojai Valley Land Conservancy's proposed Ventura River Watershed Riparian Resilience Program estimates approximately $7.8 million for full-watershed invasive species removal and riparian restoration, covering work across an 800-acre project area and roughly 100 acres of *Arundo donax* removal, including early detection rapid response (EDRR), permitted monitoring, surveys and treatment, native plant restoration, and regulatory compliance (Strategy 1.3.a, detailed below). Based on comparable project experience in the Santa Clara River, monitoring and removal alone can cost on the order of $25,000 per acre, or approximately $2.5 million for 100 acres of removal, with the remainder associated with EDRR, planting, and permitting. These example costs illustrate the scale of investment required for watershed-wide actions and underscore the need for phased implementation, collaborative funding, and dedicated long-term financial planning as VRWRP actions move toward implementation.

Actions selected for Implementation Roadmap development are marked with a star in the strategy tables that follow. Figure 43 provides an overview of the full set of goals and strategies.

Figure 42 Action Scale and Type

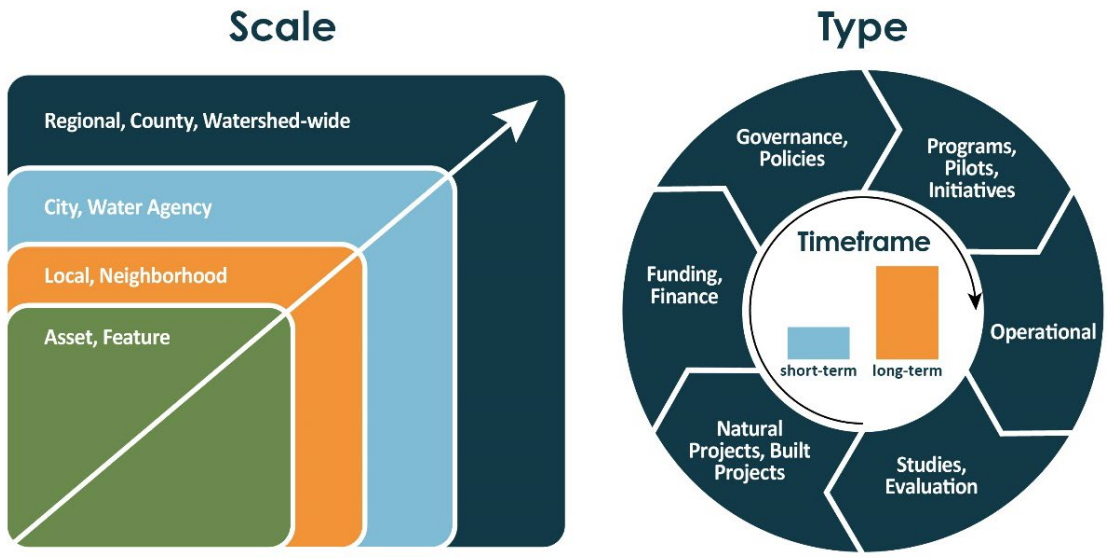


Figure 43 Goals and Strategies

Goal 1: Ecosystem Health is Strengthened Watershed-Wide

Strategy 1.1: Restore and Protect Native Forest, Woodland, and Upland Ecosystems
Strategy 1.2: Improve Soil Health and Watershed Function Across the Watershed
Strategy 1.3: Restore Riparian Corridors and Enhance Habitat Connectivity
Strategy 1.4: Enhance Aquatic Ecosystems and Steelhead Resilience

Goal 2: Water Supply is More Reliable and Water Infrastructure is More Climate-Resilient

Strategy 2.1: Improve Groundwater Basin Understanding and Monitoring
Strategy 2.2: Implement Conjunctive Use and Demand Management
Strategy 2.3: Evaluate and Protect Long-Term Water Supply Reliability

Goal 3: Communities, Infrastructure, and Ecosystems are Protected from Erosion, Flooding, and Shoreline Change Driven by Sea Level Rise and Storm Surge

Strategy 3.1: Upgrade and Strategically Relocate Critical Infrastructure
Strategy 3.2: Rely on Nature-Based Solutions to Protect Coastal Infrastructure

Goal 4: Flood and Erosion Risks to Communities, Infrastructure, Water Quality, and Ecosystems from Extreme Precipitation are Minimized

Strategy 4.1: Modernize Flood, Stormwater, and Wastewater Management Infrastructure
Strategy 4.2: Enhance Erosion Control, Sediment Management, and Floodplain Function
Strategy 4.3: Manage Septic and Wastewater Risks to Water Quality

Goal 5. Recreational Access for Community Enjoyment is Protected and Enhanced

Strategy 5.1: Build Climate-Adaptive, Multi-Functional Public Spaces
Strategy 5.2: Enhance Recreation Management and Protect Sensitive Habitats

Goal 6. Agricultural Practices Are Adapted to the Effects of Climate Change and Sustain a Thriving Local Economy and Ag-Based Livelihoods

Strategy 6.1: Promote Water-Resilient and Water Efficient Cropping and Irrigation Systems
Strategy 6.2: Promote Regenerative Agriculture and Soil Health
Strategy 6.3: Reduce Agricultural Water-Quality Impacts and Runoff

Goal 7. Coordinated Watershed Resilience is Strengthened Through the Improvement of Governance, Funding, and Monitoring Tools

Strategy 7.1: Expand Coordinated Data and Monitoring Capabilities
Strategy 7.2: Improve Interagency Coordination, Water System Preparedness, and Emergency Response
Strategy 7.3: Strengthen Funding Pathways for Implementation

Goal 8. Native Leadership and Indigenous Knowledge Strengthen Climate Resilience of Cultural Resources, Sacred Sites, Subsistence Areas, and Heritage Assets

Strategy 8.1: Strengthen Tribal-led Stewardship and Relationships by Building Tribal Capacity and Workforce Capacity
Strategy 8.2: Protect Cultural Sites from Climate-Driven Hazards, such as Wildfire, Flooding, Erosion, and Coastal Hazards
Strategy 8.3: Sustain Traditional Subsistence Resources Under Changing Climate Conditions

Strategy 1.1: Restore and Protect Native Forest, Woodland, and Upland Ecosystems

Hazards Addressed: Drought; Extreme heat; Extreme precipitation & flooding; Wildfire

Potential Implementation Metrics: Acres of upland and transitional habitat restored or maintained; Acres treated with prescribed fire, cultural burning, or targeted grazing; Reduction in fine-fuel loads; Time from disturbance event to treatment initiation (rapid response); Number of MOUs/agreements/protocols executed

Anticipated Equity Benefits: Sustainable green employment opportunities; Centers Tribal engagement and cultural resource protection

Identified Co-benefits: Erosion and sedimentation control; Improved water quality and supply; Improved soil health, Carbon sequestration, Increased biodiversity and wildlife corridors; Reduced disaster risks (floods, landslides, wildfire); Improved recreation

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
1.1.a	**Identify, restore, and maintain priority upland and transitional habitats, including native forest and woodland,** to improve ecosystem resilience to drought, wildfire, and other climate hazards through invasive species and weed removal and native revegetation. Focus on fire-impacted and erosion-prone areas, historic grazing lands, and agricultural lands taken out of production and prioritize hiring local restoration crews.	**Potential Lead(s):** Ventura County Resource Conservation District (VCRCD) **Partners:** California Department of Fish and Wildlife (CDFW); U.S. Fish and Wildlife Service (USFWS); Ojai Valley Land Conservancy (OVLC); Ventura Land Trust (VLT); CA State Parks; Los Padres National Forest (LP National Forest)	**Timeframe:** Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Natural Projects, Built Projects	Ecosystems; Flood management
1.1.b	**Implement prescribed fire, Tribal-led cultural burning, and targeted prescribed grazing** to reduce invasive annual grasses, weeds, and other fine fuels, enhance soil nutrient cycling, and support regeneration of native species. **Work with Tribal partners to integrate indigenous science** and prioritize sites that would reduce wildfire and post-erosion risks for sacred sites, ceremonial areas, and cultural-use landscapes. Integrate pre- and post-burn monitoring and follow-up invasive control where needed.	**Potential Lead(s):** County of Ventura – WPD **Partners:** Barbareño/Ventureño Band of Mission Indians (BVBMI); Native Coast Action Network (NCAN); LP National Forest; CDFW; CA State Parks; County of Ventura; VCRCD; OVLC; Ojai Valley Fire Safe Council	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Natural Projects, Built Projects	Ecosystems; Cultural resources; Flood management

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
1.1.c	Following wildfire **implement rapid-response removal efforts and targeted restoration using local restoration crews** to maintain native vegetation structure, including in native forest and woodland areas. Prioritize high-risk destabilized slopes, aspects, and previously burned areas where regeneration is slow, using invasive-grass suppression, erosion control, native seeding, and vegetation management.	**Potential Lead(s):** VCRCD County of Ventura – WPD **Partners:** VLT; LP National Forest; CA State Parks; City of Ventura; OVLC	Long-term	**Scale**: Local, Neighborhood **Type**: Operational; Natural Projects, Built Projects	Ecosystems; Flood management
1.1.d	Develop management plans that: (1) **reduce erosion** through drainage improvements, slope stabilization, and post-fire treatments; (2) **reduce wildfire severity** through vegetation and fuel -management; and (3) **control invasive species spread** through coordinated surveys, removal, and follow-up monitoring.	**Potential Lead(s):** LP National Forest **Partners:** OVLC; VLT; County of Ventura; CA State Parks; CDFW	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Governance, Policies	Ecosystems; Flood management; Water quality

Strategy 1.2: Improve Soil Health Across the Watershed

Hazards Addressed: Drought; Extreme heat; Extreme precipitation & flooding

Potential Implementation Metrics: Number of green-infrastructure or LID retrofits installed; Reduction in peak flows and runoff volume at hotspots; Area of impervious surface converted to permeable materials; Acres of land conserved or protected through acquisitions or easements; Improvement in soil-health indicators on conserved or restored lands

Anticipated Equity Benefits: Improves access to safe recreation and cooling in heat-burdened areas;

Identified Co-benefits: Urban heat-island mitigation and air-quality benefits; Habitat and biodiversity gains; Recreation and public health benefits; Reduced erosion and sedimentation impacts on infrastructure

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
1.2.a	**Expand flow-conditioned infiltration and green-infrastructure projects in areas where they can most effectively support instream flows**, guided by technical toolkits and plans such as the Ventura River Instream Flow & Water Resilience Framework and Toolkit, municipal stormwater technical guidance manuals, and watershed management plans. Use complementary tools (such as the Integrated Water Strategies Toolkit Quantification) to identify locations with strong potential for runoff reduction, water-quality improvement, and infiltration to maximize any potential recharge benefits. Prioritize projects in overburdened communities and areas contributing to downstream instream stress.	**Potential Lead(s):** County of Ventura; City of Ventura **Partners:** VCRCD; City of Ojai; Community-Based Organizations involved in watershed stewardship, habitat restoration, environmental justice; commercial-center owners, redevelopment partners; OVLC	Short-term	**Scale**: City, Water Agency; Local, Neighborhood **Type**: Natural Projects, Built Projects	Ecosystems; Flood management; Water quality; Groundwater management
1.2.b	**Expand funding, incentives, and retrofit programs for permeable surfaces, climate-appropriate landscaping, and reduced hardscape in existing developed areas**. Prioritize voluntary retrofits of older neighborhoods and commercial corridors, with a focus on reducing heat-island effects, improving water quality, and enhancing urban habitat, with consideration for any potential recharge benefits. Target investments to heat-burdened, low tree-canopy, and overburdened communities, and identify sustained funding mechanisms to scale green infrastructure implementation beyond what is currently required under MS4 permits.	**Potential Lead(s):** County of Ventura; City of Ventura **Partners:** VCRCD; City of Ojai	Short-term	**Scale**: City, Water Agency **Type**: Programs, Pilots, Initiatives	Ecosystems; Flood management; Water quality; Groundwater management

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
1.2.c	Advance land stewardship and conservation by **protecting high-value lands that support critical soil-health, hydrologic, ecological, and cultural functions through acquisitions and easements, and by restoring degraded lands through targeted, adaptive management**. To guide long-term conservation and restoration investments, identify and prioritize parcels that provide significant watershed or habitat benefits, or exhibit high erosion-reduction potential (such as steep or highly erodible slopes, areas with active sediment loss, or locations with degraded soils).	**Potential Lead(s):** OVLC; VLT **Partners:** VCRCD; BVBMI; NCAN	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Governance, Policies	Water supply; Ecosystems; Cultural resources

Strategy 1.3 Restore Riparian Corridors and Enhance Habitat Connectivity

Hazards Addressed: Drought; Extreme precipitation & flooding; Wildfire

Potential Implementation Metrics: Acres of invasive species removed; Reduction in Arundo cover or regrowth; Acres of upland and transitional habitat restored or maintained; Increase in connected habitat corridors or linear miles of functional connectivity restored; Increase in native riparian canopy cover or shading; Reduction in bank-erosion rates at treated sites; Miles of floodplain or riparian habitat reconnected or restored

Anticipated Equity Benefits: Improves Tribal access to culturally significant aquatic species, riparian vegetation, and riverine habitats

Identified Co-benefits: Habitat and biodiversity gains; Reduced erosion and sedimentation impacts on infrastructure; Reduced water consumption by invasive plants and increased streamflows; Improved water quality and nutrient cycling; Reduced wildfire risk and restored natural fuelbreaks of riparian areas

Action	Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
1.3.a  **Scale up watershed-scale removal and eradication of erosion-prone and water intensive invasive species that thrive under changing climate conditions, such as *Arundo donax***, using VCRCD's programmatic permits to expedite implementation. Prioritize upstream-to-downstream removal to prevent reinfestation, stabilize treated and fire-impacted banks with native riparian vegetation, and apply natural or engineered bio-stabilization techniques to reduce erosion, improve water quality, and prevent undercutting during high-flow events. **Monitor restored reaches to ensure long-term habitat recovery, increased shading, and reduced water loss.**	**Potential Lead(s):** OVLC; County of Ventura – WPD; VCRCD **Partners:** OVLC; VLT; CA State Parks; Casitas Municipal Water District (Casitas MWD); Ventura River Water District (VRWD); Ventura River Groundwater Sustainability Agency (VRGSA); Surfrider; licensed vegetation-management and restoration contractors; local native-plant nurseries/seed suppliers; willing private riparian landowners; local trail stewardship groups	Short- to long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Natural Projects, Built Projects	Ecosystems; Water supply; Water quality; Groundwater management

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
1.3.b	**Identify, restore, protect, and maintain priority transitional upland–riparian buffer habitats**, including Matilija Canyon, Upper San Antonio Creek, Coyote Creek tributaries, to **enhance wildlife movement, riparian shading, and long-term stewardship of riparian corridors**. Focus efforts where wildfire, erosion, or invasive species have reduced buffer function, and coordinate with landowners and Tribal partners to support stewardship of culturally significant ecological areas and resources within these corridors.	**Potential Lead(s):** OVLC; VLT **Partners:** U.S. Forest Service (USFS); VCRCD; BVBMI; NCAN; Casitas MWD; VRWD; VRGSA	Short-term	**Scale**: Asset, Feature **Type**: Studies, Evaluation; Natural Projects, Built Projects	Ecosystems; Cultural resources; Water quality
1.3.c	**Plan and implement wildlife and plant movement corridors along riparian corridors, tributaries, and upland ecotones** to maintain genetic flow, climate-driven species movement, and access to water during drought. Prioritize connectivity in infrastructure design, land management plans, and post-fire, flood-risk, and habitat-restoration planning, using tools such as conservation easements, wildlife-friendly crossings, and corridor restoration to create continuous pathways linking the upper watershed, riparian zones, and coastal areas.	**Potential Lead(s):** VCRCD **Partners:** CDFW; USFWS; OVLC; VLT; CA State Parks; LP National Forest; Casitas MWD; VRWD; VRGSA	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Natural Projects, Built Projects	Ecosystems

Strategy 1.4 Enhance Aquatic Ecosystems and Steelhead Resilience

Hazards Addressed: Drought; Extreme heat, Extreme precipitation and flooding

Potential Implementation Metrics: Acres of mapped and protected aquatic cold-water and climate refugia; Number of aquatic invasive-species treatment sites; Reduction in aquatic invasive species abundance; Number of coordinated removal campaigns implemented; Miles of stream or habitat reopened to steelhead following barrier removal; Improvement in upstream habitat accessibility or quality

Anticipated Equity Benefits: Improves Tribal access to culturally significant aquatic species, riparian vegetation, and riverine habitats; Supports Tribal stewardship priorities through restoration of ecological functions essential to cultural practices

Identified Co-benefits: Habitat and biodiversity enhancements

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
1.4.a	**Identify, map, protect, and restore cold-water and climate refugia** (including north-facing slopes, shaded canyons, perennial pools, spring-fed reaches, and off-channel habitats) that buffer species from drought-reduced streamflows, extreme-heat-driven water-temperature increases, and flow intermittency now occurring in historically perennial reaches. Use climate, hydrologic, and habitat data to locate priority refugia and implement targeted actions such as riparian shading restoration, vegetation management, habitat connectivity improvements, and pool-stabilization measures to support species like steelhead whose migration cues and habitat availability are increasingly disrupted by warming streams and altered flow timing. Align implementation with ongoing instream-flow planning and outcomes of the Ventura River adjudication to ensure consistency with the watershed's long-term water-management "physical solution."	**Potential Lead(s):** VCRCD **Partners:** CDFW; USFWS; National Oceanic and Atmospheric Administration (NOAA) Fisheries; OVLC; VLT; CA State Parks; LP National Forest	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Studies, Evaluation; Natural Projects, Built Projects	Ecosystems

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
1.4.b	**Develop targeted aquatic invasive species removal campaigns** to remove species such as green sunfish, bullfrogs, crayfish, and carp, that proliferate under drought, extreme heat, and flood-driven habitat disturbance, and outcompete or prey on native species such as steelhead during warm, low-flow conditions. Partner with the USFWS and CDFW to implement mechanical removal efforts, and pair removal with riparian and instream habitat improvements (coordinated with related riparian restoration actions 1.3.a, 1.3.b, and 1.3.c) that address post-fire sedimentation, reduced shading, and warmer stream temperatures affecting steelhead and other native species. Integrate monitoring to evaluate effectiveness. Coordinate efforts with landowners, USFWS, CDFW, NOAA Fisheries, and Tribal partners.	**Potential Lead(s):** VCRCD **Partners:** CDFW; USFWS; NOAA Fisheries; BVBMI; NCAN; OVLC; VLT	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Natural Projects, Built Projects	Ecosystems
1.4.c	**Support coordinated planning, permitting, and implementation efforts to remove Matilija Dam**, restoring steelhead access to habitats farther upstream and reestablishing natural river processes that are increasingly important as drought reduces seasonal flows, extreme heat elevates water temperatures, post-fire sediment pulses reshape channels, and altered hydrologic cues disrupt steelhead migration and lifecycle timing. Dam removal also reconnects headwater cold-water refugia that help species withstand multi-year droughts and warming stream conditions.	**Potential Lead(s):** County of Ventura – WPD; VCRCD **Partners:** CDFW; USFWS; NOAA Fisheries; OVLC; CA State Parks; LP National Forest; Resources Legacy Fund; State Coastal Conservancy; CalTrout; Surfrider Foundation	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Governance, policies	Ecosystems; Flood management; Groundwater management; Water supply; Water quality

Strategy 2.1 Improve Groundwater Basin Understanding and Monitoring

Hazards Addressed: Drought; Extreme precipitation & flooding; Extreme heat

Potential Implementation Metrics: Acres of non-SGMA groundwater-influenced and surface-water-supported ecosystems assessed; Number of domestic wells mapped or evaluated for drought vulnerability; Reduction in the number of domestic wells at risk during drought; Completion of a countywide drought resilience plan or equivalent guidance; Establishment and operation of a standing county drought and water-shortage task force

Anticipated Equity Benefits: Reduces drought, water-shortage, and water-quality risks for domestic well users, including low-income, rural, Tribal, and agricultural communities

Identified Co-benefits: Delivers habitat and biodiversity improvements; enhances climate resilience and heat-mitigation through groundwater-supported ecological functions; improves water-quality protection; improves multi-agency coordination and governance efficiency

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
2.1.a	Building upon existing efforts at UVRGA and OBGMA, and in accordance with GSP implementation, **assess and document non-SGMA groundwater-influenced and surface-water-supported ecosystems** in upland, riparian, and transitional areas of the watershed that fall outside formal groundwater basin boundaries or are not fully captured in current GSP monitoring networks. Coordinate with the GSAs to ensure consistency with basin-scale assessments, avoid duplication, and improve understanding of groundwater–ecosystem linkages across the full watershed.	**Potential Lead(s):** VCRCD; OVLC; VLT **Partners:** Ojai Basin Groundwater Management Agency (OBGMA); Upper Ventura River Groundwater Agency (UVRGA); CDFW; SWRCB; Ventura County; City of Ventura – Ventura Water; Casitas MWD; MOWD; VRWD; City of Ojai	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Studies, evaluation	Ecosystems; Groundwater management
2.1.b	Leverage UVRGA, OBGMA, the anticipated Ventura County Drought Resilience Plan, and domestic well assessment efforts to **map, characterize, and assess risks to domestic well users under drought conditions**, with emphasis on overburdened communities, low-income households, rural communities, Tribal residents, and agricultural workers who rely on shallow domestic wells and are disproportionately exposed to drought-related water shortages.	**Potential Lead(s):** OBGMA; UVRGA; VRWD **Partners:** Casitas MWD; Meiners Oaks Water District (MOWD); County of Ventura	Short-term	**Scale**: City, Water Agency **Type**: Studies, evaluation	Water supply; Groundwater management; Water quality

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
2.1.c	Building on the work of the Ventura County Drought Resilience Task Force and anticipated Drought Resilience Plan, **develop a plan to improve long-term water resilience for domestic wells and small water systems** (prioritizing support for overburdened, low-income, rural, Tribal, and agricultural communities that face the highest risk of drought-related supply interruptions), and establish a County drought and water shortage task force to implement the recommendations of the Drought Resilience Plan, coordinate drought-response actions across agencies, and represent the needs of domestic well users and small water system operators during planning and emergency response within the county's jurisdiction.	**Potential Lead(s):** County of Ventura **Partners:** OBGMA; UVRGA; Casitas MWD; VRWD; MOWD	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Studies, Evaluation; Governance, Policies	Water supply; Groundwater management

Strategy 2.2 Implement Conjunctive Use and Demand Management

Hazards Addressed: Drought; Extreme heat

Potential Implementation Metrics: AF of water conserved; Reduced AF of water pumped during low-flow periods; Stabilization of shallow well levels; AF shifted to wet-season supply under conjunctive-use operations; Program participation (number of accounts, acres)

Anticipated Equity Benefits: Reduces water insecurity for domestic well users, small water systems, rural communities, and residents; Supports small growers, Tribal communities, and cost-burdened households through tailored participation pathways, incentives, and flexible demand-management options

Identified Co-benefits: Climate resilience and public-health benefits from more reliable water supplies during extreme heat and drought; Operational efficiency and coordination gains through integrated conjunctive-use and demand-management frameworks; Habitat and biodiversity improvements

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
2.2.a 	Pending the outcome of the adjudication process and aligning with GSPs, **utilize a new or existing watershed coalition to serve as a forum for transparent, watershed-wide coordination on water use**. Use the forum to support optimization of conjunctive-use and demand-management programs under worsening drought conditions, and help strengthen or expand existing measures such as shifting pumping to high-flow periods, limiting extraction from river-connected wells during drought, and addressing both direct and indirect streamflow-depletion effects, with focused consideration for overburdened communities, small growers, domestic well users, and Tribal and rural communities. The forum should also enhance transparency in water-management decisions by improving information-sharing across agencies and making key water-use data more accessible to the public.	**Potential Lead(s):** UVRGA, OBGMA, City of Ventura – Ventura Water **Partners:** Casitas MWD; VRWD; MOWD	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Governance, Policies	Water supply; Groundwater management; Ecosystems

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
2.2.b	**Expand and better coordinate residential and municipal water conservation and demand-management programs in areas where additional savings remain achievable**, building on existing rebate, turf-replacement, water-wise landscaping, water-use survey, and leak-detection programs. For municipal purveyors, focus on sustaining and enhancing programs already required under the Making Conservation a California Way of Life regulation through long-term funding and targeted equity measures. In parallel, **develop a watershed-wide, climate-informed conservation framework for agricultural and commercial users** that sets long-term efficiency targets and supports expanded participation through targeted outreach and enhanced incentives for small farms, including flexible demand-management options that allow drought responses to be scaled to user capacity.	**Potential Lead(s):** Casitas MWD; City of Ventura – Ventura Water; VRWD; MOWD **Partners:** OBGMA; UVRGA; VCRCD; Farm Bureau of Ventura County; Ventura County Agricultural Irrigated Lands Group (VCAILG); University of California Cooperative Extension (UCCE); Central Coast Alliance United for a Sustainable Economy (CAUSE)	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Programs, Pilots, Initiatives;	Water supply; Groundwater management

Goal 2: **Water Supply is More Reliable and Water Infrastructure is More Climate-Resilient**

Strategy 2.3 Evaluate and Protect Long-Term Water Supply Reliability

Hazards Addressed: Drought; Extreme heat; Extreme precipitation & flooding; Wildfire; Sea-level rise and storm surge

Potential Implementation Metrics: Completion of a quantitative climate-change analysis using CMIP6 watershed data supported by interagency workshops to review findings and implications; Development and adoption of climate-informed thresholds; Priority water-supply infrastructure sites assessed for climate resilience; Increase in protective measures implemented at high-risk infrastructure locations; Completion of feasibility assessments or pilot projects for beneficial reuse of OVSD treated effluent

Anticipated Equity Benefits: Supports reliable water access for all community members; Supports measures for most at risk infrastructure in overburdened areas of the watershed

Identified Co-benefits: Improves interagency coordination; Improves water availability for beneficial uses and users

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
2.3.a	Support coordinated hydrologic and climate-resilience studies led by Casitas MWD and the GSAs to **evaluate long-term water-supply reliability under changing climate conditions** using updated climate data (CMIP6). Studies should assess trends in surface and groundwater storage, inflows, evaporation, sedimentation, and operational performance under future climate scenarios to identify vulnerabilities and inform updates to GSPs, water-management plans, and capital investment decisions, including potential water storage opportunities. Emphasize a collaborative, interagency effort to build shared understanding of climate-change scenarios and implications for the watershed.	**Potential Lead(s):** Casitas MWD; UVRGA **Partners:** OBGMA; VRWD; MOWD; City of Ventura – Ventura Water	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Studies, Evaluation	Water supply; Water quality; Groundwater management

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
2.3.b	**Develop and update consistent, watershed-wide, climate-informed thresholds** that automatically initiate supplemental water supply actions or demand-management measures when hydrologic conditions fall below predetermined reliability benchmarks. These updated and newly-developed thresholds should incorporate the latest CMIP6 climate projections and build on existing drought-response tools already used in the watershed (including tiered pricing tied to Lake Casitas levels, Water Shortage Contingency Plan restrictions, and agency-specific drought-stage triggers) while aligning with analyses and criteria in the GSPs, the Water Management Plan, the Comprehensive Water Resources Report, the Water Efficiency and Allocation Program (WEAP), and Water Shortage Event Contingency Plan (WSECPP).	**Potential Lead(s):** OBGMA; UVRGA **Partners:** City of Ventura – Ventura Water; Casitas MWD; VRWD; MOWD; California Department of Water Resources (DWR)	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Operational	Water supply; Groundwater management
2.3.c	**Inventory and prioritize water supply infrastructure,** such as diversion structures, wells, conveyance systems, or treatment plants, **for protective measures to support their ability to withstand threats expected to increase due to climate change,** including extreme precipitation and flooding, wildfire, and sea level rise and storm surge. Use this inventory to inform asset management and operations priorities, with emphasis on facilities serving overburdened communities or those whose failure would disproportionately affect overburdened communities.	**Potential Lead(s):** City of Ventura – Ventura Water; Casitas MWD; VRWD; MOWD **Partners:** UVRGA; OBGMA; County of Ventura	Short-term	**Scale**: City, Water Agency **Type**: Studies, Evaluation	Water supply; Water quality; Flood management
2.3.d	**Evaluate feasible opportunities to beneficially reuse highly treated effluent from the Ojai Valley Sanitary District (OVSD)** in lieu of discharging it to the Ventura River. Coordinate with the City of Ventura (consistent with existing agreements) to assess purple-pipe (non-potable) reuse options such as agricultural irrigation, off-channel habitat enhancement (e.g., wetlands or shallow ponds), and other environmentally or community beneficial uses.	**Potential Lead(s):** Ojai Valley Sanitary District (OVSD) **Partners:** County of Ventura; City of Ventura – Ventura Water	Short-term	**Scale**: City, Water Agency **Type**: Studies, Evaluation	Water supply

Strategy 3.1 Upgrade and Strategically Relocate Critical Infrastructure Exposed to Sea Level Rise and Flooding

Hazards Addressed: Extreme precipitation & flooding; Sea level rise & storm surge

Potential Implementation Metrics: Completion of coastal-hazard vulnerability and feasibility assessments for priority shoreline areas; Number of coastal facilities or infrastructure sites relocated, elevated, or adapted out of high-hazard zones; Reduction in exposure of critical water and wastewater infrastructure to coastal flooding, saltwater intrusion, or erosion; Acres of coastal land preserved or transitioned through conservation or rolling easements; Number of flood-prone properties addressed through voluntary non-structural approaches (e.g., acquisition, relocation assistance, land-use transitions)

Anticipated Equity Benefits: Maintains safe, reliable water and wastewater access for all communities; Protects coastal access and public amenities relied on by overburdened residents; Reduced flood risk in areas susceptible to flooding

Identified Co-benefits: Improves recreation and public-health access by relocating facilities to safer areas; Reduces erosion, sedimentation, and long-term infrastructure damage; Lower long-term maintenance costs

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
3.1.a	**Relocate coastal trails, restrooms, parking areas, beach access points, and recreation facilities exposed to future erosion and coastal-flood hazard zones** to safer inland or elevated locations. Prioritize infrastructure that provides essential coastal access and public safety benefits.	**Potential Lead(s):** CA State Parks; County Parks; City of Ventura **Partners:** County of Ventura – WPD; VLT	Long-term	**Scale**: Local, Neighborhood **Type**: Natural Projects, Built Projects	Ecosystems
3.1.b	**Evaluate alternatives for relocating, elevating, or armoring the Seaside Transfer Station**, which is located just outside the Ventura River Watershed but is critical to regional wastewater system performance and vulnerable to sea level rise, storm surge, and coastal flooding. The evaluation should assess technical feasibility, risk reduction benefits, lifecycle costs, and regulatory considerations, and support identification of funding pathways to advance implementation of this already-planned capital project. Where appropriate, this action may also **inform evaluation of other location-specific coastal infrastructure vulnerabilities within or adjacent to the watershed** (e.g., water supply or conveyance infrastructure exposed to flooding or erosion).	**Potential Lead(s):** County of Ventura – WPD; City of Ventura **Partners:** CA Coastal Commission	Short-term	**Scale:** Asset, Feature **Type:** Studies, Evaluation	Water supply; Flood management; Water quality

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
3.1.c 	**Use the Local Coastal Program's coastal-hazard zones, sea level rise projections, and shoreline adaptation strategies, along with findings from evaluations conducted as part of action 3.1.b, to guide the hardening, elevation, or relocation of critical water and wastewater infrastructure**, prioritizing aging assets and sites with a history of overtopping or saltwater intrusion.	**Potential Lead(s):** County of Ventura – WPD and Planning Division; City of Ventura – Ventura Water; Casitas MWD; **Partners:** CA Coastal Commission; CA State Parks; Caltrans; Ventura Port District; Surfrider Foundation; local coastal property owners and utility operators (e.g., Southern California Edison (SCE) and Southern California Gas Company (SoCalGas)).	Long-term	**Scale**: Regional, County, Watershed-Wide **Type:** Natural Projects, Built Projects	Water supply; Flood management; Water quality; Groundwater management
3.1.d	**Use voluntary, non-structural flood-risk reduction strategies** (such as conservation easements, land-use transitions, relocation assistance, and acquisitions) **to reduce long-term flood and coastal-hazard exposure in coastal floodplains**. Prioritize areas where sea-level rise and storm surge make long-term development infeasible, as well as flood-prone neighborhoods where chronic flooding disproportionately affects overburdened communities.	**Potential Lead(s):** County of Ventura – WPD; VLT **Partners:** City of Ventura; CA Coastal Commission; CA State Parks	Long-term	**Scale:** Regional, County, Watershed-Wide **Type**: Governance, Policies; Programs, Pilots, Initiatives	Flood management, Ecosystems

Goal 3: **Communities, Infrastructure, and Ecosystems are Protected from Erosion, Flooding, and Shoreline Change Driven by SLR and Storm Surge**

Strategy 3.2 Rely on Nature-Based Solutions to Protect Coastal Infrastructure

Hazards Addressed: Extreme precipitation & flooding; Sea level rise & storm surge

Potential Implementation Metrics: Acres or linear feet of dunes, cobble berms, or nature-based shoreline features restored or enhanced; Reduction in shoreline erosion or storm-damage indicators at treated sites; Number of coastal infrastructure assets protected or buffered through nature-based or hybrid solutions; Increase in vegetated or stabilized shoreline areas that improve habitat and public access; Number of adaptation actions reviewed for and found consistent with Local Coastal Program (LCP) coastal-hazard policies

Anticipated Equity Benefits: Reduced disruption of essential coastal infrastructure (pump stations, parking, restrooms, beach access) used by community members; Improved safety and reliable access to coastal areas for community members who depend on shoreline spaces for cooling, recreation, and stress-relief during extreme heat or poor air-quality days

Identified Co-benefits: Habitat and biodiversity improvements; Recreation and public health benefits; Reduced erosion and sedimentation impacts on infrastructure; Lower long-term maintenance costs; Ecosystem-service benefits

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
3.2.a	Where land use and geomorphology allow, **expand nature-based shoreline resilience strategies including dune stabilization, revegetation, and hybrid sediment-based solutions** in and around open space and parks near the mouth of the Ventura River to reduce coastal flooding, buffer storm surge, and protect public access. Use lessons learned from the Surfers Point Managed Shoreline Retreat Project to guide design and implementation.	**Potential Lead(s):** County of Ventura – WPD; City of Ventura **Partners:** City of Ojai; VLT; CA State Parks	Long-term	**Scale:** Asset, Feature **Type:** Natural Projects, Built Projects	Ecosystems; Flood management; Water quality; Cultural resources
3.2.b	**Implement or expand dunes, cobble berms, vegetated buffers, or hybrid nature-based features to protect vulnerable coastal pump stations, wastewater infrastructure, parking lots, roadways, and recreation facilities** from sea level rise and storm surge-driven erosion if feasible.	**Potential Lead(s):** County of Ventura – WPD; City of Ventura **Partners:** Caltrans (State Routes 33/150); OVSD; Regional Water Quality Control Board (RWQCB) Region 4 (Los Angeles); VLT; Ventura County Fairgrounds; State Parks	Long-term	**Scale:** Asset, Feature **Type:** Natural Projects, Built Projects	Flood management; Water quality; Ecosystems

Goal 3: **Communities, Infrastructure, and Ecosystems are Protected from Erosion, Flooding, and Shoreline Change Driven by SLR and Storm Surge**

Strategy 4.1 Upgrade Flood, Stormwater, and Wastewater Management Infrastructure

Hazards Addressed: Extreme precipitation & flooding; Wildfire; Sea level rise & Storm surge

Potential Implementation Metrics: Number of priority flood assets upgraded; Reduction in peak flows and runoff volume at hotspots; Cubic yards of sediment/debris managed; Number of operational resilience measures installed at priority infrastructure; Number of levee certifications completed

Anticipated Equity Benefits: Reduces flood and infrastructure-failure risks for overburdened and low-income communities; protects public health by improving resilience of wastewater and stormwater systems during extreme events; reduces disproportionate exposure to flood, debris-flow, and post-fire hazards; and prioritizes upgrades in neighborhoods historically under-served by infrastructure investment.

Identified Co-benefits: Habitat and biodiversity gains; Groundwater recharge and baseflow support; Reduced erosion and sedimentation impacts on infrastructure

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
4.1.a 	**Analyze how projected climate impacts** (such as higher peak flows, increased sediment and debris transport, wildfire burn-scar runoff, and prolonged inundation) **will affect flood-control facilities, municipal stormwater systems, and centralized wastewater infrastructure.** Identify where systems may be exceeded under future conditions and prioritize adaptation needs such as structural upgrades, sediment-removal programs, capacity expansions, asset protection, operational improvements, and emergency-preparedness measures, with emphasis on facilities serving overburdened communities.	**Potential Lead(s):** County of Ventura – WPD; City of Ventura **Partners:** County of Ventura; City of Ojai; OVSD; VCRCD; Caltrans; local utility operators (e.g., SCE, SoCalGas); County of Ventura (Economic Development); Ventura Chamber of Commerce; Ojai Valley Chamber of Commerce	Short-term	**Scale:** Regional, County, Watershed-Wide **Type:** Studies, Evaluation	Flood management; Water quality

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
4.1.b	Using findings from Action 4.1.a, **upgrade, enlarge, or retrofit flood management infrastructure**, including diversion structures, detention and debris basins, flood-control channels, culverts, and high-flow conveyance systems, to better accommodate more intense precipitation, debris flows, and post-fire flash-flood conditions. Incorporate design features that also enhance groundwater recharge where feasible, such as modifying basins or conveyance systems to increase infiltration and reduce stormwater loss. Prioritize assets with documented overtopping, sediment blockage, debris-flow vulnerability, or whose failure would disproportionately impact overburdened communities.	**Potential Lead(s):** County of Ventura – WPD; City of Ventura **Partners:** City of Ojai	Long-term	**Scale:** Regional, County, Watershed-Wide **Type:** Natural Projects, Built Projects	Flood management; Water quality; Groundwater management
4.1.c	Using findings from Action 4.1.a, **implement targeted upgrades to municipal stormwater infrastructure**, including storm drains, culverts, outfalls, and stormwater conveyance systems, to accommodate projected increases in rainfall intensity, debris loads, and post-fire runoff. Coordinate improvements with floodplain-reconnection, green-infrastructure, and sediment-management strategies where feasible to reduce flood risk and improve water quality.	**Potential Lead(s):** County of Ventura – WPD; City of Ventura **Partners:** City of Ojai; Caltrans (State Routes 33/150)	Long-term	**Scale:** Asset, Feature **Type:** Natural Projects, Built Projects	Flood management; Water quality
4.1.d	Using findings from Action 4.1.a, **upgrade, relocate, flood-proof, or provide redundancy for centralized wastewater facilities, collection systems, pump stations, and other critical components** located in flood- or erosion-prone areas. Implement operational resilience measures, including backup power, bypass controls, and emergency-response protocols, to maintain service and reduce public-health risks during extreme events.	**Potential Lead(s):** OVSD; City of Ventura **Partners:** County of Ventura – WPD; City of Ojai; RWQCB Region 4 (Los Angeles)	Long-term	**Scale:** Asset, Feature **Type:** Operational; Natural Projects, Built Projects	Flood management; Water quality, Water supply
4.1e	**Assess levee conditions and complete state and federal certifications to reduce flood risk and accommodate increasing storm flows anticipated from climate change**. Prioritize levees that protect overburdened communities and low-income agricultural areas. Supplement FEMA flood modeling with climate-adjusted hydrologic analyses and update design standards to reflect future flood conditions.	**Potential Lead(s):** County of Ventura – WPD; City of Ventura **Partners:** City of Ojai	Short-term	**Scale:** City, Water Agency **Type:** Studies, Evaluation	Flood management

Goal 4: **Flood and Erosion Risks to Communities, Infrastructure, Water Quality, and Ecosystems from Extreme Precipitation are Minimized**

Strategy 4.2 Enhance Erosion Control, Sediment Management, and Floodplain Function

Hazards Addressed: Extreme precipitation & flooding; Wildfire

Potential Implementation Metrics: Reduction in sediment and debris loads at priority hotspots; Miles of floodplain or riparian habitat reconnected or restored; Number of engineered or nature-based stabilization sites implemented and maintained; Reduction in bank-erosion rates at treated sites; Adoption of shared, cross-jurisdictional streambank and erosion-management guidelines

Anticipated Equity Benefits: Reduces flood and erosion risks for overburdened and rural/agricultural communities

Identified Co-benefits: Enhances habitat and biodiversity; Reduces sediment impacts on infrastructure; Strengthens climate resilience through restored floodplains and stabilized channels

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
4.2.a	**Implement a coordinated, watershed-wide sediment-management framework to guide where and how sediment-reduction interventions occur**. This includes upstream sediment capture, strategic sediment release (where ecologically beneficial), and post-fire sediment and debris protocols. Identify and catalogue sediment-generation and deposition hotspots to inform prioritization, and use shared sediment-transport data and consistent design assumptions to avoid downstream or opposite-bank impacts. Integrate and build on sediment analyses prepared for the Matilija Dam removal to support coordinated implementation.	**Potential Lead(s):** County of Ventura – WPD **Partners:** City of Ojai; City of Ventura	Short-term	**Scale:** Regional, County, Watershed-Wide **Type:** Operational; Studies, Evaluations	Flood management; Water quality
4.2.b	Guided by the framework and findings from 4.2.a, **apply site-specific stabilization treatments to redirect flows, reduce sediment input, and protect natural features and infrastructure**. Treatments could include flow deflectors, rock vanes, or rootwad revetments. Use monitoring results to target interventions at the most active or vulnerable locations and to support ongoing, adaptive management across the watershed and, if necessary, to promote land acquisition/conservation of river bottom parcels.	**Potential Lead(s):** County of Ventura – WPD **Partners:** City of Ojai; City of Ventura; VCRCD; OVLC; VLT	Long-term	**Scale:** Regional, County, Watershed-Wide **Type**: Natural Projects, Built Projects	Flood management; Water quality

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
4.2.c	**Facilitate floodplain inundation on parcels adjacent to over-constrained river and creek reaches**, where feasible, by increasing storage capacity and restoring riparian and wetland habitats on parcels that commonly flood. These actions can reduce flood velocities and deliver ecological benefits, with groundwater-recharge benefits realized in locations where site conditions support them.	**Potential Lead(s):** County of Ventura – WPD; VCRCD **Partners:** City of Ventura; City of Ojai; OVLC; VLT; Groundwater Sustainability Agencies (GSAs)	Long-term	**Scale:** Regional, County, Watershed-Wide **Type:** Natural Projects, Built Projects	Ecosystems; Flood management; Groundwater management
4.2.d	**Develop a coordinated approach to streambank and erosion management** by establishing shared design guidelines, consistent stabilization standards, and a collaborative process for prioritizing and reviewing projects across jurisdictions. Enable agencies, landowners, and partners to align efforts, reduce reactive and piecemeal interventions, and address cross-bank and downstream impacts more effectively.	**Potential Lead(s):** County of Ventura – WPD; City of Ventura **Partners:** City of Ojai; VCRCD; OVLC; VLT; CA State Parks; LP National Forest	Short-term	**Scale:** Regional, County, Watershed-Wide **Type:** Governance, Policies	Flood management
4.2.e	**Use nature-based solutions and other non-structural flood-risk reduction strategies to reduce long-term flood exposure for communities, resources, and infrastructure in floodplains**, such as flood easements, land acquisitions, zoning updates, or development controls. Prioritize flood-prone neighborhoods where chronic flooding disproportionately affects overburdened communities.	**Potential Lead(s):** County of Ventura – WPD; City of Ventura; City of Ojai **Partners:** VCRCD; OVLC; VLT	Long-term	**Scale:** Regional, County, Watershed-Wide **Type:** Governance, Policies	Flood management
4.2.f	**Evaluate opportunities to enhance infiltration of increased runoff from extreme precipitation** in hydrogeologically suitable areas (e.g., upper-watershed alluvial fans), where increased recharge would be feasible and beneficial.	**Potential Lead(s):** UVRGA; OBGMA **Partners:** County of Ventura	Short-term	**Scale:** Watershed-Wide	Water supply; Groundwater management; Flood management; Water quality; Ecosystems

Goal 4: **Flood and Erosion Risks to Communities, Infrastructure, Water Quality, and Ecosystems from Extreme Precipitation are Minimized**

Strategy 4.3 Manage Septic and Wastewater Risks on Water Quality

Hazards Addressed: Extreme precipitation & flooding, Sea level rise & storm surge

Potential Implementation Metrics: Reduction in pollutant concentrations at compliance/target sites; Improved water quality conditions downstream of conversions; Number of septic-to-sewer conversions, especially in overburdened communities and other high-risk areas of the lower watershed

Anticipated Equity Benefits: Reduces septic-related contamination risks for overburdened and flood-prone communities; Improves safety for households near streams, shallow groundwater, and drinking-water wells; Supports access to reliable wastewater services

Identified Co-benefits: Improves recreation and public health conditions by reducing pathogen and nutrient pollution in waterways

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
4.3.a	**Conduct watershed-wide assessments to identify areas where septic systems pose elevated risks to water quality** due to shallow groundwater, flood exposure, proximity to streams or wells, or high septic system density. Prioritize locations for coordinated septic-to-sewer conversions, with a focus on overburdened, flood-prone, stream-adjacent communities, and coordinate with LAFCo and County planning departments to ensure that priority areas can be served without creating growth-inducing sewer extensions. Build on and update the septic/onsite wastewater treatment system hotspot analyses generated through the State Water Resources Control Board Groundwater–Surface Water Model for the Ventura River Watershed, which included a forensic study to prioritize high-risk onsite wastewater treatment system areas.	**Potential Lead(s):** Ventura County (Watershed Protection/Public Works/ Environmental Health Division) **Partners:** City of Ventura; City of Ojai; OVSD; RWQCB Region 4 (Los Angeles)	Short-term	**Scale**: Regional, County, Watershed-Wide **Type:** Studies, evaluation	Water quality; Groundwater management
4.3.b	Using the assessments from 4.3.a, **implement septic-to-sewer conversions in overburdened communities and other prioritized areas**, including North Rice Road, Trusty Lane, and Casitas Springs. Develop these projects in close collaboration with OVSD, Ventura County, Ventura LAFCo, and the Regional Water Quality Control Board to ensure that sewer extensions, designs, and phasing align with water-quality objectives, community needs, and long-term asset management.	**Potential Lead(s):** Ventura County (Watershed Protection/Public Works/ Environmental Health Division); OVSD **Partners:** City of Ventura; City of Ojai; RWQCB Region 4 (Los Angeles)	Short- to long-term	**Scale:** Local, Neighborhood **Type:** Natural Projects, Built Projects	Water quality; Groundwater management

Goal 4: **Flood and Erosion Risks to Communities, Infrastructure, Water Quality, and Ecosystems from Extreme Precipitation are Minimized**

Strategy 5.1 Build Climate-Adaptive, Multi-Functional Public Spaces

Hazards Addressed: Extreme heat; Extreme precipitation & flooding; Wildfire

Potential Implementation Metrics: Acres of flood-adaptive parks or open spaces designed or retrofitted; Number of floodplain parks implementing Flood Operations & Public Safety Plans; Number of culturally focused or community-led spaces or programs created in partnership with Tribes and local organizations

Anticipated Equity Benefits: Expanded access to safe, climate-adaptive parks for all community members; Improved public safety for overburdened individuals in flood-prone areas

Identified Co-benefits: Heat-exposure reduction in developed or low-canopy areas and cooling benefits; Improved riparian and upland habitat quality; Enhanced recreation, public health, and community-wellbeing outcomes; Strengthened cultural connections and stewardship across communities and Tribes

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
5.1.a	**Retrofit existing parks and public open spaces** within mapped floodplains and wildfire hazard areas to safely accommodate climate hazards using materials, layouts, and native vegetation that can withstand periodic flood inundation and wildfire exposure, including Foster Park and Camp Comfort. Prioritize fire-resilient design features such as ignition-resistant structures, defensible-space layouts, and native, fire-adapted plant palettes. Prioritize locations in overburdened communities and where mapped heat-burdened, low-canopy conditions heighten the need for safe, climate-adaptive public spaces.	**Potential Lead(s):** County Parks; State Parks **Partners:** OVLC; VLT; USFS; City of Ventura - Ventura Water; VCRCD; CDFW; USFWS	Long-term	**Scale**: Asset/Feature **Type**: Studies, Evaluation; Natural Projects, Built Projects	Ecosystems; Flood management
5.1.b	**Develop and implement Flood Operations & Public Safety Plans for floodplain parks, river access points, and trails**, including Foster Park and Camp Comfort. Identify closure protocols, signage, and emergency communication procedures that are culturally responsive and available in the primary languages spoken in surrounding communities. Coordinate with the Watershed Protection District and relevant public agencies to identify and implement longer-term strategies that address safety risks associated with encampments in flood-prone areas and support the relocation of vulnerable individuals out of hazardous zones.	**Potential Lead(s):** County of Ventura – WPD; County Parks **Partners:** City of Ventura; City of Ojai; OVLC; VLT; CA State Parks	Short-term	**Scale**: Asset/Feature **Type**: Operational; Studies, Evaluation	Flood management

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
5.1.c	**Support opportunities for cultural, spiritual, and community-based connection** to watershed landscapes, recognizing the emotional and cultural impacts of environmental change, loss, and disruption from climate change. **Create and enhance spaces for reflection, education, and healing** that acknowledge environmental grief, foster stewardship, and strengthen relationships between people and place, such as interpretive areas, quiet-use zones, art installations, storytelling, and community-led programming. Prioritize inclusive engagement and co-creation with local communities, Tribes, artists, educators, and cultural practitioners, particularly in areas where communities have experienced repeated climate, wildfire, flood, or displacement impacts.	**Potential Lead(s):** County of Ventura; BVBMI; Santa Ynez Band of Chumash Indians; Coastal Band of the Chumash Nation; NCAN **Partners:** City of Ventura; CA State Parks; City of Ojai; OVLC, VLT	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Programs, Pilots, Initiatives	Cultural resources

Goal 5: **Recreational Access for Community Enjoyment is Protected and Enhanced**

Strategy 5.2 Enhance Recreation Management and Protect Sensitive Habitats

Hazards Addressed: Drought; Extreme heat; Extreme precipitation & flooding

Potential Implementation Metrics: Increase in tree-canopy coverage in priority low-canopy neighborhoods; Number of ADA-accessible and erosion-resilient river access points upgraded; Number of recreation management plans completed or implemented; Reduction in erosion or water-quality impacts at high-use recreation sites

Anticipated Equity Benefits: Expanded heat-relief and shaded recreation opportunities for all communities, especially overburdened and heat-burdened communities; Improved safe and accessible river access for residents who rely on low-cost outdoor spaces for cooling, mobility, and recreation

Identified Co-benefits: Urban heat-island mitigation and improved public health; Enhanced habitat quality and riparian vegetation protection; Reduced erosion and sedimentation from unmanaged recreation; Increased trail safety, accessibility, and long-term sustainability of high-use areas

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
5.2.a	**Design and implement a Ventura River Corridor Tree Canopy Expansion Program** to increase shade coverage along trails, parks, and river access points using drought-tolerant, native trees, prioritizing mapped low-canopy, high-heat neighborhoods such as Westside Ventura and Oak View where heat relief is a documented equity need. Partner with the City and County agencies to build upon existing active transportation and extreme heat projects.	**Potential Lead(s):** City of Ventura; County of Ventura **Partners:** City of Ojai; VCRCD; OVLC; VLT; CalFire Urban Forestry; State Parks; local school districts; CAUSE and other CBOs/Environmental Justice partners	Long-term	**Scale**: Local, Neighborhood **Type**: Programs, Pilots, Initiatives; Studies, Evaluation	Ecosystems
5.2.b	**Upgrade and standardize safe, ADA-accessible river access points** with clear signage, erosion control, and water safety features to support equitable recreation. Identify and incorporate lessons learned from the OVLC's Old Baldwin Trailhead Project at the Ventura River Preserve.	**Potential Lead(s):** County Parks; CA State Parks; **Partners:** City of Ventura; OVLC; VLT	Long-term	**Scale**: Asset, Feature **Type**: Natural Projects, Built Projects	Ecosystems

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
5.2.c ★	**Develop and implement site-specific Recreation Management Plans for high-use river areas** to balance public access with habitat protection in the face of more extreme precipitation, flooding, heat, and drought, and create or enhance alternative recreation hubs outside sensitive habitats to redistribute visitor pressure. Prioritize designs that protect sensitive vegetation, reduce erosion and water-quality impacts, and improve long-term ecological resilience to climate change while maintaining safe, sustainable access for the community. Leverage success of OVLC's Ventura River Preserve and incorporate lessons learned in future projects. Ensure public access priorities are incorporated into long-term implementation of the Matilija Dam Ecosystem Restoration Project (MDERP).	**Potential Lead(s):** OVLC; VCRCD **Partners:** CDFW; USFWS; NOAA Fisheries; VLT; CA State Parks; LP National Forest; MDERP Partners	Short-term	**Scale**: Asset, Feature **Type**: Studies, Evaluation; Natural Projects, Built Projects	Ecosystems

Strategy 6.1 Promote Climate-Resilient and Water Efficient Cropping and Irrigation Systems

Hazards Addressed: Drought; Extreme heat

Potential Implementation Metrics: Increase in irrigation-efficiency upgrades adopted by growers; AF of water conserved; Number of deficit-irrigation or drought-resilient crop trials completed; Adoption of wildlife-protective irrigation practices

Anticipated Equity Benefits: Improved technical assistance and cost-saving opportunities for small growers and cost-burdened agricultural operations;

Identified Co-benefits: Reduced groundwater and surface-water demand; Improved ecological conditions through wildlife-protective diversion and irrigation practices; Enhanced soil health and long-term agricultural viability; Enhanced employment stability for farmworker communities through climate-resilient crop transitions

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
6.1.a	Advance climate-resilient irrigation practices by **expanding irrigation-efficiency programs** (e.g., micro-irrigation, soil-moisture sensors, optimized scheduling), **piloting deficit-irrigation strategies where agronomically feasible, and implementing wildlife-protective irrigation practices that reduce ecological conflicts during low-flow periods.** Provide technical assistance to growers, with a focus on small growers, to improve water-use efficiency, maintain agricultural productivity, and protect instream flows. **Expand agriculture irrigation-efficiency programs** (micro-irrigation, soil moisture sensors, optimized scheduling) and provide technical support to maximize water savings per acre.	**Potential Lead(s):** VCRCD; UCCE **Partners:** Farmers; Farm Bureau of Ventura County	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Programs, Pilots, Initiatives	Water supply; Water quality
6.1.b	**Assess and pilot drought-resilient and lower-water-demand crop transitions** through a collaborative process with growers, UC Extension, and technical partners to protect farmer livelihoods in future climate conditions. Conduct agronomic, economic, and market viability evaluations; identify transition pathways that support grower capacity and farmworker employment stability; and pilot transitions on selected fields to evaluate performance and feasibility. Prioritize participation pathways for small growers and use pilot results to guide broader, climate-resilient crop adoption across the watershed.	**Potential Lead(s):** VCRCD; UCCE **Partners:** Farmers; Farm Bureau of Ventura County	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Studies, Evaluation	Water supply; Water quality

Strategy 6.2 Promote Regenerative Agriculture and Soil Health

Hazards Addressed: Drought; Extreme heat; Extreme Precipitation & flooding; Sea-level rise and storm surge

Potential Implementation Metrics: Number of growers and acres of farmland participating in soil-health and climate-resilient agriculture programs; AF of water conserved; Reduction in pollutant concentrations at compliance/target sites; Number of water-quality standard exceedances at compliance/target sites; Acres of agricultural-lined waterways restored/enhanced

Anticipated Equity Benefits: Reduces risk for rural/agricultural communities and domestic well users; Supports participation of small growers and cost-burdened households

Identified Co-benefits: Habitat and biodiversity improvements; Reduced erosion and sedimentation; Water quality improvements

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
6.2.a	**Collaborate with the Natural Resource Conservation Service (NRCS) Environmental Quality Incentives Program (EQIP) and the California Healthy Soils Program to expand grower participation in soil-health and climate-resilient agriculture programs**. Provide application support, site assessments, cost-share assistance, and technical support for practices such as cover crops, compost application, reduced tillage, hedgerows, buffers, pollinator habitat, perennial and drought-tolerant plantings, diversified cropping systems, and agroforestry to increase soil organic matter, reduce erosion, enhance water retention and water quality, and improve climate resilience. Provide targeted outreach and one-on-one application assistance to small and mid-sized farms, socially overburdened farmers and ranchers, and growers in priority overburdened and farmworker communities so they can access funding, reduce costs, and maintain livelihoods under increasing heat and drought stress.	**Potential Lead(s):** VCRCD; UCCE **Partners:** Farmers; National Resource Conservation Service (NRCS); Farm Bureau of Ventura County	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Programs, Pilots, Initiatives; Funding, Finance	Ecosystems; Water quality,
6.2.b	**Identify priority locations along San Antonio Creek and the Ventura River to restore and establish native vegetated buffers, hedgerows, and filter strips along agricultural-lined waterways** to improve soil health, reduce erosion, and enhance resilience to climate-driven stressors such as extreme heat, intense precipitation, and drought.	**Potential Lead(s):** VCRCD **Partners:** Farmers; UCCE; Farm Bureau of Ventura County; OVLC; VLT	Long-term	**Scale:** Asset, Feature **Type**: Studies, Evaluation; Natural Projects, Built Projects	Ecosystems; Water quality,

Goal 6: **Agricultural Practices Are Adapted to the Effects of Climate Change and Sustain a Thriving Local Economy and Ag-Based Livelihoods**

Strategy 6.3 Reduce Agricultural Water-Quality Impacts and Runoff

Hazards Addressed: Drought; Extreme heat; Extreme precipitation & flooding; Sea-level rise and storm surge

Potential Implementation Metrics: Reduction in pollutant concentrations at compliance/target sites; Number of monitoring sites added, upgraded, or integrated; Number of growers and acres of farmland adopting BMPs

Anticipated Equity Benefits: Reduces water quality risks for rural/agricultural communities and domestic well users;

Identified Co-benefits: Habitat and biodiversity gains; Reduced erosion and sedimentation impacts on infrastructure

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
6.3.a 	**Conduct a Ventura River Agricultural Runoff Climate Vulnerability Assessment** focused on land uses and facility types with the greatest uncertainty in water-quality impacts under current and future climate conditions. Build on existing irrigated-lands monitoring (which shows relatively low recent impairments from irrigated agriculture) and prioritize evaluating nutrient, sediment, and pathogen loading risks from livestock, manure, and equine facilities. Map and characterize areas of concern, assess seasonal and storm-driven loading patterns, and evaluate how drought, extreme heat, extreme precipitation, and sea-level rise may alter future conditions, including downstream effects on sensitive reaches and the Ventura River estuary. Coordinate closely with VCAILG to align with existing monitoring and reporting programs and avoid duplication.	**Potential Lead(s):** VCRCD; Farm Bureau of Ventura County; VCAILG **Partners:** UCCE; RWQCB; State Water Resources Control Board; growers and packing houses; irrigation efficiency vendors; compost and soil amendment suppliers; UCCE	Short-to mid-term	**Scale**: Regional, County, Watershed-Wide **Type**: Studies, Evaluation	Ecosystem; Water quality
6.3.b	Leverage existing efforts at the Ventura County Resource Conservation District and partner agencies to **implement nutrient-management, erosion-control, and runoff BMPs on farms and orchards.** These practices help counteract climate-driven increases in water-quality risks, including more intense rainfall that mobilizes sediments and nutrients, prolonged drought that concentrates pollutants, and extreme heat that elevates evapotranspiration and salinity accumulation. They also reduce pollutant loading risks under sea level-rise and storm surge conditions, which elevate estuary water levels, increase backwatering during storms, and intensify the upstream mobilization of sediments and nutrients into the Ventura River estuary.	**Potential Lead(s):** VCRCD; UCCE **Partners:** Farm Bureau of Ventura County; City of Ventura; County of Ventura; City of Ojai	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Programs, Pilots, Initiatives	Water quality

Goal 6: **Agricultural Practices Are Adapted to the Effects of Climate Change and Sustain a Thriving Local Economy and Ag-Based Livelihoods**

Strategy 7.1 Expand Coordinated Watershed-wide Data and Monitoring Capabilities

Hazards Addressed: Drought; Extreme heat; Extreme precipitation & flooding; Wildfire; Sea level rise and storm surge

Potential Implementation Metrics: Completion of a coordinated watershed-scale ecological monitoring framework and indicator set; Number of monitoring sites added, upgraded, or integrated; Integration of enhanced storm-forecasting or atmospheric-river tools into agency operations; Establishment and operation of a watershed-scale low-flow and water-quality monitoring network; Reduction in response time or improved preparedness for extreme storm or low-flow events

Anticipated Equity Benefits: Improves early warning, flood preparedness, and water-quality protection for all communities, especially those in flood- and fire-prone areas; Enhances Tribal access to monitoring data and supports inclusion of Traditional Ecological Knowledge in watershed decision-making

Identified Co-benefits: Improved habitat and biodiversity outcomes through better ecological trend detection; Increased public-health protection via enhanced storm-event forecasting and water-quality monitoring; Stronger cross-agency coordination and data sharing

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
7.1.a	Strengthen watershed-wide data coordination by **convening a quarterly data-management subgroup under the Ventura River Watershed Council to align ongoing data-collection efforts, improve data sharing, and explore development of a publicly accessible data hub on the Council's website**. Ensure Tribal representation and follow Tribal leadership and guidance regarding the integration and protection of Tribal data.	**Potential Lead(s):** Watershed Council **Partners:** VCRCD; Watershed Council Member Agencies	Short-term	**Scale**: Regional, County, Watershed-Wide **Type:** Studies, Evaluation	Water supply; Ecosystems; Flood management; Water quality; Groundwater management; Cultural resources
7. 1.b 	Using the coordinated data systems and data-management subgroup established in Action 7.1.a, **develop a watershed-scale ecological monitoring framework to track climate-driven change and inform adaptive management across upland, riparian, and aquatic habitats.** Build on existing monitoring programs and integrate appropriate indicators, including wildfire-driven vegetation change, post-fire sediment and debris dynamics, and sea level rise and storm surge effects on estuary and coastal habitats. Incorporate Traditional Ecological Knowledge where consented, to support restoration, land management, and protection of ecosystem and cultural resources.	**Potential Lead(s):** VCRCD; OVLC **Partners:** BVBMI; NCAN; VLT; CA State Parks; California State University Channel Islands (CSUCI); University of California, Santa Barbara (UCSB)	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Studies, Evaluation	Ecosystems; Cultural resources

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
7.1.c	**Enhance watershed forecasting capabilities by integrating advanced atmospheric-river, extreme-precipitation, post-fire debris-flow, and coastal-hazard forecasting tools into County and partner-agency systems**. Build on the coordinated data systems established through Action 7.1.a to ensure these forecasting improvements support adaptive management and multi-agency emergency response. Partner with academic and research institutions (such as the Center for Western Weather and Water Extremes (CW3E) at Scripps Institution of Oceanography or UC Santa Barbara) to incorporate research-driven forecasting tools and decision-support systems into local planning. Provide training for agencies and first responders to apply these enhanced tools in capital-improvement planning, flood and debris-flow preparedness, and emergency-response protocols.	**Potential Lead(s):** County of Ventura – WPD **Partners:** Scripps Institution of Oceanography – CW3E; CSUCI; UCSB	Long-term	**Scale**: City, Water Agency **Type**: Studies, Evaluation; Operational	Flood management
7.1.d	**Develop a watershed-scale low-flow and water-quality monitoring network to track conditions during extreme heat and drought**, with priority for stream reaches that rural domestic well users are reliant on, stream reaches with recreation areas used by overburdened communities, and locations identified as steelhead refugia identified as part of Action 1.4.a. Deploy monitoring equipment near flow-enhancement, stormwater capture, riparian restoration, and refuge-enhancement efforts to evaluate improvements in sustained baseflows and reduction in chronic water-quality risks. Coordinate with existing Ventura Countywide Stormwater Quality Management Program monitoring locations and UVRGA's Aquatic Groundwater-Dependent Ecosystem study to avoid duplication and strengthen data integration within the watershed-wide system established in Action 7.1.a.	**Potential Lead(s):** County of Ventura – WPD; VCRCD **Partners:** City of Ventura; City of Ojai; OVLC; VLT; GSAs	Short- to long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Studies, Evaluation	Water supply; Ecosystems; Flood management; Water quality; Groundwater management

Goal 7: **Coordinated Watershed Resilience is Strengthened Through the Improvement of Governance, Funding, and Monitoring Tools**

Strategy 7.2 Improve Interagency Coordination, Water System Preparedness and Emergency Response

Hazards Addressed: Drought; Extreme precipitation & flooding; Wildfire; Extreme heat, Sea level rise & storm surge

Potential Implementation Metrics: Number of agencies convening in interagency coordination meetings; Adoption of emergency response protocols; Number of cultural-resource salvage, digitization, or repatriation protocols established; Deployment of multilingual extreme-weather alert tools across jurisdictions; Improvements to cultural-resource information-sharing systems supporting Tribal ownership; Demonstrated reduction in emergency-response gaps or improved coordination during real or simulated events

Anticipated Equity Benefits: Improves emergency communication and preparedness for overburdened, farmworker, and unhoused communities; Strengthens Tribal sovereignty through enhanced cultural-resource protection and data ownership protocols

Identified Co-benefits: More efficient and coordinated cross-agency operations; Reduced loss or damage to cultural resources during extreme events; Enhanced public health and safety through clearer emergency protocols; Greater trust and collaboration among agencies, Tribes, and community partners

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
7.2.a	**Use the existing Ventura River Watershed Council as the primary forum for coordinating implementation of the Ventura River Watershed Resilience Plan, while exploring options to formalize governance structures** (e.g., interagency agreements or MOUs) to improve cross-jurisdictional decision-making. This includes overcoming administrative silos by better aligning stormwater, flood, groundwater, and land-use programs to support multi-benefit opportunities. The Council will track implementation and facilitate collaboration among agencies, Tribes, community organizations, and landowners as post-MDERP and adjudication needs evolve. Strengthened governance should prioritize overburdened and agricultural communities, coordinated permitting, long-term maintenance, adaptive management, sediment and debris management, co-management plans, and invasive-species control.	**Potential Lead(s):** VCRCD **Partners:** Watershed Council Members	Short- to long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Governance, Policies	Flood management; Water quality; Water supply; Groundwater management; Cultural Resources; Ecosystems

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
7.2.b	**Convene regular interagency coordination meetings across water providers to align on state emergency preparedness and response requirements** (e.g., AB 367 emergency preparedness planning for water systems), **share and coordinate emergency response plans, and develop a shared emergency preparedness checklist and mutual aid protocol**. Meeting frequency should be right-sized based on need (e.g., annual or biennial meetings with ad-hoc convenings during emerging risks or declared emergencies) to balance preparedness benefits with staff capacity. The Ventura River Watershed Council may serve as a standing forum to elevate cross-cutting preparedness issues, track shared risks across hazards, and maintain continuity between emergency planning cycles.	**Potential Lead(s):** City of Ventura – Ventura Water; County of Ventura – WPD; **Partners:** OBGMA; UVRGA; Casitas MWD; VRWD; MOWD; VCRCD; Watershed Council Members	Short- to long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Governance, Policies; Operational	Water supply; Groundwater management
7.2.c	**Establish a cross-jurisdictional working group to develop and pilot a unified flood, fire, and extreme weather alert protocol**, including standardized message templates, multilingual content, and a shared dissemination platform, with particular emphasis on reaching overburdened communities, farmworker populations, unhoused residents, and other groups with limited access to traditional emergency communications. Building on the enhanced forecasting tools in action 7.1.b, expand warning systems to include sirens, better coordinated multi-agency alert protocols, and aerial notifications that take into account the multi-lingual and cultural diversity needs of the most overburdened communities in the watershed.	**Potential Lead(s):** County of Ventura – WPD; City of Ventura **Partners:** County of Ventura; City of Ojai; mass-notification providers; wireless carriers; local radio/TV; outdoor-siren vendors; Chambers of Commerce; Economic Development Collaborative of Ventura County	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Programs, Pilots, Initiatives; Operational	Flood management
7.2.d	**Develop and strengthen cultural resource protection and information-sharing systems that support Tribal ownership, control, and stewardship** of cultural records and resources at risk from climate-driven hazards. This may include creating Tribal-led protocols for secure data management, digitization, and emergency salvage and repatriation; establishing culturally appropriate information sharing pathways among Tribes and agencies; and integrating these practices into existing cultural resource management programs and project-level Best Management Practices. Identify opportunities to align with existing Tribal, agency, and archival programs that already conduct cultural resource preservation, documentation, or emergency-response activities.	**Potential Lead(s):** BVBMI; Santa Ynez Band of Chumash Indians; Coastal Band of the Chumash Nation **Partners:** NCAN; CA Office of Historic Preservation; County of Ventura; City of Ventura; City of Ojai	Long-term	**Scale**: City, Water Agency **Type**: Governance, Policies	Cultural resources

Goal 7: **Coordinated Watershed Resilience is Strengthened Through the Improvement of Governance, Funding, and Monitoring Tools**

Strategy 7.3 Strengthen Funding Pathways for Implementation

Hazards Addressed: Drought; Extreme precipitation & flooding; Sea level rise & storm surge; Wildfire; Extreme heat

Potential Implementation Metrics: Amount of funding secured through Proposition 4 or other major state and federal programs that benefits overburdened communities; Number of joint, multi-benefit grant applications submitted or awarded; Number of Tribal Capacity Funding Plan initiatives implemented or funded; Dollars invested in coastal adaptation, wastewater upgrades, and climate-resilient infrastructure; Number of funded priority VRWRP projects; Dollars invested in overburdened communities

Anticipated Equity Benefits: Increases access to funding for overburdened communities; Strengthens Tribal leadership and cultural-resource stewardship through dedicated funding and capacity pathways

Identified Co-benefits: Improved readiness and implementation capacity for multi-benefit projects; Enhanced protection of critical water, wastewater, and coastal infrastructure; Greater efficiency through bundled, cross-agency funding applications

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
7.3.a	**Create a long-term funding and coordination framework** overseen by the Ventura River Watershed Council to encourage coordination among entities and **secure and sustain the resources needed** to implement actions in the Ventura River Watershed Resilience Plan. The framework should help identify and evaluate appropriate funding mechanisms (e.g., targeted ballot measures, bonds, dedicated fees, interagency cost-sharing, and state/federal grants) matched to specific program and project needs. Collaborative/multi-agency pursuits for funding should be coordinated through the Ventura River Watershed Council wherever feasible.	**Potential Lead(s):** Watershed Council **Partners:** VCRCD; Economic Development Collaborative of Ventura County; City of Ventura & City of Ojai – Economic Development; CAUSE; Ventura County Community Foundation	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Funding, Finance	Flood management; Water quality; Water supply; Groundwater management; Cultural Resources; Ecosystems
7.3.b	**Submit at least two joint, large-scale state grant applications through Proposition 4** that bundle complementary flood, water supply, wastewater, water quality, and/or habitat projects, with a focus on overburdened communities. Applications should emphasize multi-benefit outcomes, interagency coordination, partnerships with non-traditional entities, and readiness to implement.	**Potential Lead(s):** Watershed Council **Partners:** VCRCD	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Funding, Finance	Flood management; Water quality; Water supply; Groundwater management; Cultural Resources; Ecosystems

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
7.3.c	**In partnership with the Tribes, develop and implement a Tribal Capacity Funding Plan** that includes grant applications, long-term revenue strategies, and formal partnerships to support Tribal leadership, staffing, and cultural resource protection efforts. Align the Plan and funding opportunities with Tribal priorities and needs.	**Potential Lead(s):** BVBMI **Partners:** Watershed Council; VCRCD; NCAN	Short-term	**Scale**: City, Water Agency **Type**: Funding, Finance	Cultural resources
7.3.d	**Secure funding for coastal adaptation projects in the lower Ventura River Watershed and adjacent coastal HUC-12 watersheds that experience sea level rise, storm surge, and coastal erosion**. Priority funding sources may include the State Coastal Conservancy Climate Ready Program, Ocean Protection Council grants, SB 1, California Coastal Commission LCP grants, and other applicable coastal adaptation programs. Efforts should focus on projects that reduce risk to communities, critical infrastructure, and coastal ecosystems, including assets located just outside the Ventura River Watershed boundary that are functionally connected to watershed resilience (e.g., areas within the Arundell Barranca–Frontal Pacific Ocean watershed).	**Potential Lead(s):** County of Ventura – WPD; City of Ventura; CA State Parks **Partners:** State Coastal Conservancy; CA Coastal Commission	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Funding, Finance	Ecosystems; Flood management
7.3.e	**Leverage state and federal funding programs**—including the Clean Water State Revolving Fund (CWSRF), SAFER Program, IBank ISRF, and WaterTalks technical assistance resources—**to support wastewater upgrades, septic-to-sewer conversions, flood-resilient sanitation infrastructure, and flood-, debris-flow-, and wildfire-resilient water-supply improvements.** Where feasible, partner with the Regional Water Quality Control Board and other relevant agencies, and prioritize investments that reduce contamination, public-health, and climate-related risks for overburdened communities.	**Potential Lead(s):** City of Ventura; County of Ventura; City of Ojai **Partners:** Watershed Council; VCRCD; City of Ojai; RWQCB Region 4 (Los Angeles)	Long-term	**Scale**: City, Water Agency **Type**: Funding, Finance	Water supply; Flood management; Water quality
7.3.f	**Assess increased operational, storage, and supply-related costs incurred by water and wastewater agencies during extended emergency conditions** (e.g., drought, wildfire, flooding, power outages), including costs associated with emergency water purchases, treatment and pumping, temporary storage, backup power, staffing, debris management, and regulatory compliance. **Where cost burdens are significant or recurring, evaluate and establish sustainable funding mechanisms** such as reserve policies, rate structures, interagency cost-sharing agreements, or emergency financing tools to ensure continuity of service and fiscal resilience.	**Potential Lead(s):** Casitas MWD; City of Ventura – Ventura Water; VRWD; MOWD **Partners:** OBGMA; UVRGA; OVSD; VCRCD; SCE, SoCalGas; CAUSE; County of Ventura – Economic Development, Economic Development Collaborative of Ventura County	Long-term	**Scale**: City, Water Agency **Type**: Operational; Funding, Finance	Water supply; Flood management; Water quality

Goal 7: **Coordinated Watershed Resilience is Strengthened Through the Improvement of Governance, Funding, and Monitoring Tools**

Strategy 8.1 Strengthen Tribal-led Stewardship and Relationships by Building Tribal and Workforce Capacity

Hazards Addressed: Drought; Extreme precipitation & flooding; Sea level rise & storm surge; Wildfire; Extreme heat

Potential Implementation Metrics: Number of MOUs/agreements/protocols executed; Number of non-Tribal agency staff who have completed Tribal led trainings on land stewardship; Number of restoration projects with a Tribal co-lead; Number of Tribal stewardship crews or number of labor hours completed; Number of acres restored through by Tribal stewardship programs

Anticipated Equity Benefits: Strengthens Tribal leadership and cultural-resource stewardship through co-management opportunities; Increases education on Indigenous Knowledge and practices to non-Tribal agencies and their staff; Intergenerational knowledge transfer

Identified Co-benefits: Sustainable employment and revenue generation through Tribal stewardship programs; Enhanced biodiversity and watershed health; Reduced wildfire severity

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
8.1.a	**Engage with BVBMI (Chumash) leadership, knowledge keepers, and culture bearers to support respectful partnerships and collaboration with land managers, agencies, and Indigenous-led organizations**. This includes supporting Tribal participation in long-term planning, preparedness, and recovery efforts, integrating Indigenous Knowledge into climate adaptation planning and implementation, and fostering partnerships that build Tribal capacity and shared stewardship with Tribes and Indigenous Led organizations.	**Potential Lead(s):** BVBMI; Santa Ynez Band of Chumash Indians; Coastal Band of the Chumash Nation; NCAN **Partners:** VCRCD; City of Ventura; City of Ojai; Los Padres NP; OVLC; Ventura Land Trust; CA State Parks	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Operational	Cultural Resources; Ecosystems
8.1.b	Support the **development and expansion of Tribal stewardship and workforce programs focused on climate adaptation, including cultural burning, ecological monitoring, post-fire recovery, and habitat restoration**. Build long-term capacity by expanding opportunities for Tribal participation and leadership within existing prescribed-fire trainings, restoration projects, and monitoring programs, and by developing pathways for Tribal stewardship crews and ecological monitors to lead or co-lead vegetation management and climate adaptation activities across the watershed.	**Potential Lead(s):** BVBMI; Santa Ynez Band of Chumash Indians; Coastal Band of the Chumash Nation; NCAN **Partners:** VCRCD; City of Ventura; City of Ojai; Los Padres NP; OVLC; Ventura Land Trust; CA State Parks	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Programs, Pilots, Initiatives	Cultural Resources; Ecosystems

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
8.1.c	**Support Tribes in expanding the dissemination of cultural burning and Tribal stewardship knowledge by enhancing existing training and developing new training opportunities** for agencies, land trusts, parks staff, fire agencies, and private landowners. Strengthen understanding across all land managers of cultural burning practices, Tribal stewardship methods, and cultural-resource protection protocols during land management and emergency response.	**Potential Lead(s):** BVBMI; Santa Ynez Band of Chumash Indians; Coastal Band of the Chumash Nation; NCAN **Partners:** VCRCD; City of Ventura; City of Ojai; Los Padres NP; OVLC; Ventura Land Trust; CA State Parks	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Programs, Pilots, Initiatives	Cultural Resources; Ecosystems
8.1.d	In coordination with Tribes, landowners, and agencies, **develop and implement formal strategies and collaboration frameworks** to partner with Chumash People, elevate Tribal leadership, support ecosystem stewardship, and move beyond minimum consultation requirements.	**Potential Lead(s):** BVBMI; Santa Ynez Band of Chumash Indians; Coastal Band of the Chumash Nation **Partners:** VCRCD; NCAN; City of Ventura; City of Ojai; Los Padres NP; OVLC; Ventura Land Trust; CA State Parks	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Operational	Cultural Resources; Ecosystems

Goal 8: **Native Leadership and Indigenous Knowledge Strengthen Climate Resilience of Cultural Resources, Sacred Sites, Subsistence Areas, and Heritage Assets**

Strategy 8.2 Protect Cultural Sites from Climate-Driven Hazards Such as Wildfire, Flooding, Erosion, And Coastal Hazards

Hazards Addressed: Drought; Extreme precipitation & flooding; Sea level rise & storm surge; Wildfire; Extreme heat

Potential Implementation Metrics: Number of MOUs/agreements/protocols executed; Certified Tribal monitoring workforce; Tribal-led inter-agency trainings; Finalized Cultural Resource Protection Action Plan

Anticipated Equity Benefits: Recognized Tribal sovereignty; Protected cultural resources; Tribal career pathways; Indigenous-led emergency recovery

Identified Co-benefits: Improved regional disaster resilience; Enhanced climate-adaptive watershed management; Increased multi-jurisdictional planning efficiency; Streamlined inter-agency emergency protocols; Reinforced land manager cultural literacy

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
8.2.a	Strengthen coordination among Tribes, land managers, and agencies to **support climate-responsive preparedness, emergency response, and recovery that protects cultural resources and respects Tribal leadership and knowledge**. Support training, partnerships, and capacity building that strengthen Tribal participation in preparedness, response, and recovery. This may include Tribal-informed emergency response, post-fire and post-flood recovery, and site protection protocols that reduce risk and protect cultural integrity as conditions change.	**Potential Lead(s):** BVBMI; Santa Ynez Band of Chumash Indians; Coastal Band of the Chumash Nation; NCAN **Partners:** VCRCD; County of Ventura; City of Ventura; City of Ojai	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Operational	Cultural Resources
8.2.b	**Develop a Tribal-led cultural-resource protection action plan**, in partnership with appropriate Tribes and organizations trained in cultural-resource stewardship, **to build the workforce, capacity, and tools needed to protect sacred sites, village sites, archaeological sites, and other culturally significant places** against climate hazards. The plan should outline strategy, training needs, cultural-sensitivity protocols, and resource and budget requirements. Consult with Chumash Tribal leadership and engage knowledge keepers, culture bearers, and willing landowners to support respectful collaboration and long-term stewardship partnerships.	**Potential Lead(s):** BVBMI; Santa Ynez Band of Chumash Indians; Coastal Band of the Chumash Nation **Partners:** VCRCD; NCAN; County of Ventura; City of Ventura; City of Ojai	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Programs, Pilots, Initiatives	Cultural Resources

Strategy 8.3 Sustain Traditional Subsistence Resources (Including Clean Drinking Water) Under Changing Climate Conditions

Hazards Addressed: Drought; Extreme precipitation & flooding; Sea level rise & storm surge; Wildfire; Extreme heat

Potential Implementation Metrics: Executed access agreements; Restored cultural stewardship acreage; Increased traditional species abundance; Integrated TEK management plans; Facilitated gathering events; Species-specific restoration metrics; Collaborative resource monitoring reports

Anticipated Equity Benefits: Executed access agreements; Restored cultural stewardship acreage; Increased traditional species abundance; Integrated TEK management plans; Facilitated gathering events; Species-specific restoration metrics; Collaborative resource monitoring reports

Identified Co-benefits: Enhanced watershed biodiversity; increased native plant resilience; improved soil water retention; climate-adapted habitat restoration; reduced invasive species cover; strengthened cross-jurisdictional partnerships; shared ecological monitoring data

Action		Implementation Lead(s) & Partner(s)	Timeframe	Scale / Type	Water Resource System(s)
8.3.a	**Improve Tribal access to culturally significant sites, traditional gathering areas, and subsistence resources across public and privately owned lands and waters,** especially where climate change-driven flooding, drought, wildfire, or altered streamflows affect access. Work with Tribal governments, land managers, and landowners to identify priority locations and establish access protocols, agreements, or co-management approaches that protect cultural integrity and support continued gathering for food, medicine, materials, and ceremony.	**Potential Lead(s):** BVBMI; Santa Ynez Band of Chumash Indians; Coastal Band of the Chumash Nation **Partners:** VCRCD; NCAN; City of Ventura; City of Ojai	Short-term	**Scale**: Regional, County, Watershed-Wide **Type**: Programs, Pilots, Initiatives	Cultural Resources
8.3.b	Collaborate with land managers and Tribal partners **to protect, restore, and enhance culturally significant plant and wildlife resources under changing climate conditions** through Tribally led or Tribally informed stewardship areas, priority habitat restoration, and species-specific management actions (e.g., oak regeneration; willow, tule, and sedge restoration; basketry-material management). Integrate Traditional Ecological Knowledge into restoration and adaptive-management practices to guide long-term stewardship.	**Potential Lead(s):** BVBMI; Santa Ynez Band of Chumash Indians; Coastal Band of the Chumash Nation; NCAN **Partners:** VCRCD; City of Ventura; City of Ojai; Los Padres NP; OVLC; Ventura Land Trust; CA State Parks	Long-term	**Scale**: Regional, County, Watershed-Wide **Type**: Programs, Pilots, Initiatives	Cultural Resources; Ecosystems

Goal 8: **Native Leadership and Indigenous Knowledge Strengthen Climate Resilience of Cultural Resources, Sacred Sites, Subsistence Areas, and Heritage Assets**

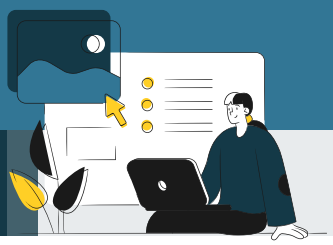
Implementation Roadmaps

A subset of actions—one per goal—has been selected for deeper analysis through Implementation Roadmaps, presented below. These roadmaps translate high-level actions into clear implementation pathways, outlining key steps, roles and responsibilities, potential funding sources, hurdles to overcome, success metrics, and existing programs that can be leveraged.

The selected actions represent complex, multi-benefit efforts that require cross-agency collaboration and were elevated through input from Advisory Group members, Tribal partners, and the public. Together, the roadmaps provide a practical blueprint for moving priority actions from planning into coordinated, on-the-ground implementation while highlighting opportunities for permitting efficiency, coordination, and shared resources across partners.

Action 1.3.a Implementation Roadmap

Action 1.3.a: Scale up watershed-scale removal and eradication of erosion-prone and water intensive invasive species that thrive under changing climate conditions, such as Arundo donax, using Ventura County RCD's programmatic permits to expedite implementation. Prioritize upstream-to-downstream removal to prevent reinfestation, stabilize treated and fire-impacted banks with native riparian vegetation, and apply natural or engineered bio-stabilization techniques to reduce erosion, improve water quality, and prevent undercutting during high-flow events. Monitor restored reaches to ensure long-term habitat recovery, increased shading, and reduced water loss.



Key Steps to Implementation

A watershed-wide Arundo eradication and long-term monitoring program requires consistent detection, coordinated removal, and committed long-term maintenance for effective eradication. The steps below outline a phased, repeatable process.

Assessment and Prioritization

- Maintain an up-to-date watershed map of Arundo populations using drones, fixed-point photography, and INSAR/remote sensing.
- Evaluate site conditions (bank stability, access, fire history, recreation) to rank priority treatment areas from upstream to downstream.
- Establish annual workplans that adjust to hydrologic conditions and observed regrowth.
- Assess how anticipated changes in climate conditions will enhance the spread of Arundo.

Treatment and Restoration

- Apply standardized removal methods (mechanical, chemical, biomass extraction).
- Implement Early Detection and Rapid Response to prevent new infestations.
- Install native riparian vegetation and bio-stabilization treatments immediately post-removal.

Community Involvement and Monitoring

- Inclusive Outreach and Education efforts for inclusive community involvement.
- Leverage VCRCD's Programmatic Permit to enroll landowners, advance shovel-ready CEQA-compliant projects and readily apply to grant funding
- Coordinate with Tribal groups, neighborhood coalitions, underserved communities and landowners for access and early detection.
- Document progress with photo-points, drone surveys, and vegetation monitoring.

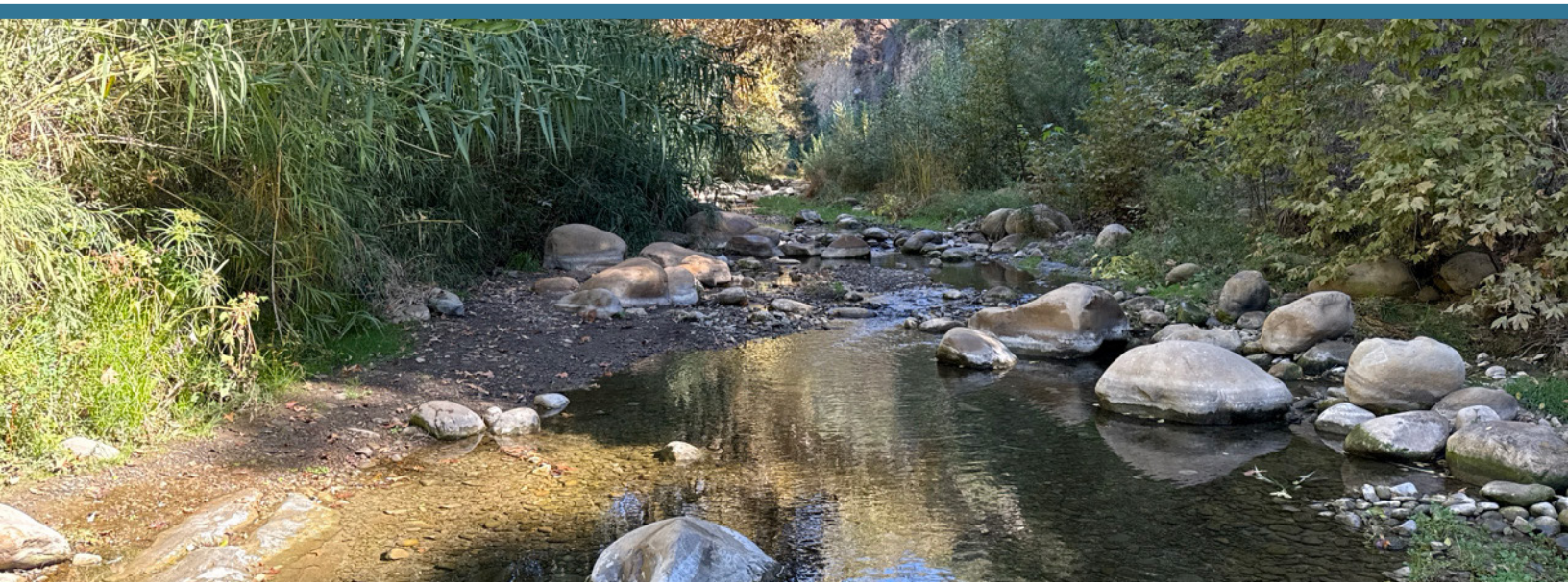
Implementation Leads and Partners

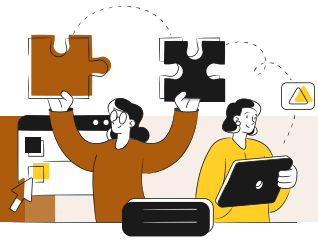
Potential Leads:

- **OVLC:** Lead on field implementation, monitoring, and land stewardship in preserved lands.
- **VCRCD:** Lead permitting, programmatic CEQA/NEPA, technical assistance, watershed-scale coordination.
- **VLT:** Implementation on lower watershed parcels; outreach and volunteer coordination.
- **County of Ventura – WPD:** Removal on County lands, integration with debris-basin and flood-management operations.

Potential Key Partners:

- **CA State Parks, City of Ventura, Ventura County Parks:** Access permissions, in-park removal, restoration coordination.
- **Fire Departments (County/City):** Aerial flyovers to identify patches; community education.
- **Agricultural Commissioner, Farm Bureau:** Engagement with growers; best practices for riparian buffers and access.
- **Local landowners and neighborhood coalitions:** Access permissions, long-term monitoring, spread prevention.
- **GSAs (UVRGA, OBGMA):** Information conduit, basin-wide reporting (e.g., adding "Have you seen Arundo?" to annual water-use reports).
- **Sheriff's Dept. Ventura PD, Ventura Human Services Agency, and CBOs serving unhoused:** Coordination around sites with unhoused populations.
- **Caltrans:** Removal at bridge crossings and transportation ROWs.





Existing Projects and Efforts to Leverage

- **VCRCD's programmatic permits** provide the foundation for implementation, reducing the time and cost for invasive removal while allowing for real-time documentation of habitat resilience to extreme weather.
- **WPD's Matilija Canyon work** serves as a proof of concept for large-scale removal; implementation should build on this to track how cleared reaches respond to seasonal flow variability and drought stress.
- **OVLC and VLT riparian restoration projects** provide stewardship capacity, ensuring cleared areas transition into native-dominated communities that improve microclimate cooling and local heat island mitigation.
- **The regional Habitat Conservation Plan framework** simplifies compliance; efforts should align with these protocols to monitor how native species recovery supports regional climate adaptation goals.
- **INSAR, drone imagery, and AI mapping** should be integrated to detect Arundo patches and monitor climate-driven variables like fuel load accumulation and evapotranspiration changes across the watershed.
- **Community-based stewardship and neighborhood coalitions** can expand detection capacity, using community science to monitor shifts in phenology or water availability at the property level.

Implementation Metrics

Successful implementation is measured by both the extent of Arundo removal and the durability of restored riparian systems.

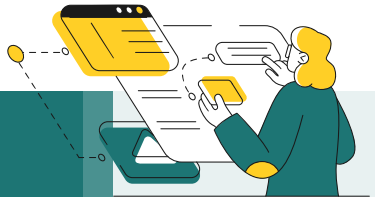
- **Eradication Efficacy:** Track percent kill rates and regrowth density to ensure biomass reduction and minimal rhizome recovery.
- **Strategic Transition:** Shift priority reaches to maintenance once statistical probability of absence confirms eradication.
- **Footprint and Enrollment:** Monitor changes in percent canopy cover alongside new landowner participation rates.
- **Ecological Recovery:** Measure native recruitment and canopy shading to verify restored habitat and reduced water loss.
- **Advanced Monitoring:** Leverage advanced monitoring technologies such as AI-assisted mapping to automate data collection for GSA and watershed reporting.

Funding Considerations

Arundo eradication requires a significant upfront investment because complete removal and multi-year retreatment are labor-intensive. After major stands are cleared, costs drop substantially, shifting to lower-cost annual maintenance focused on early detection and rapid response. Without this ongoing maintenance, reinfestation can occur quickly.

Potential Funding Sources

- CalFire Wildfire Prevention Grants (significant scale for fuel reduction + riparian vegetation work).
- CDFW FRGP, WCB, Coastal Conservancy: Riparian restoration and species recovery.
- Local governments: Long-term maintenance allocations (County, City, State Parks).
- Federal earmarks: Watershed resilience and invasive species control.
- GSA rate structures (if justified through groundwater/surface-water benefits).
- MDERP alignment to integrate removal into floodplain restoration.



Hurdles to Overcome

Arundo eradication is technically feasible but financially and logistically demanding.

Landownership Challenges

- Highly parcelized river corridor; incomplete participation allows reinfestation.
- Need mechanisms to transfer access permissions when properties change ownership.
- Varied landowner motivations require clear communication of multi-benefits (fire safety, water savings, improved stream function).

Implementation Challenges

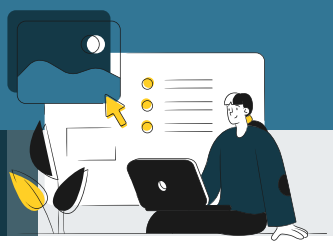
- Multi-year, labor-intensive removal with recurring regrowth.
- Potential replacement by other invasive species without sustained maintenance.
- Community concerns about herbicide use; need transparent best-practices guidance.

Funding and Capacity

- Long-term maintenance rarely funded; grants typically end after 3–5 years.

Action 2.2.a Implementation Roadmap

Action 2.2.a: Pending the outcome of the adjudication process and aligning with GSPs, utilize a new or existing watershed coalition to serve as a forum for watershed-wide coordination on water use. Use the forum to optimize conjunctive use and flexible demand-management programs under worsening drought conditions to protect instream flows and supply resilience. Consider actions such as shifting pumping to high-flow periods, limiting extraction from river-connected wells during droughts, and addressing both direct and indirect streamflow-depletion effects, while providing focused consideration for small growers, domestic well users, and Tribal and rural communities.



Key Steps to Implementation

Convene Coordinated Workgroup and Compile Foundational Technical Information

- Convene a multi-agency workgroup to guide development of a climate-informed management plan.
- Use GSA work products and local expertise to identify areas with strong surface–groundwater connections.
- Expand streamflow-gaging and well-monitoring in priority zones and update existing models as needed.

Develop a Climate-Informed Conjunctive-Use Management Plan

- Define flow thresholds (high, normal, low) for each area and develop corresponding conjunctive-use rulesets.
- Create interactive maps and tools, and identify needed equipment upgrades to make hydrologic conditions data accessible to water users.
- Prepare adaptive management plans, including pumping rules tied to instream-flow thresholds, and develop a standardized annual reporting template.
    - Minimal restrictions during high-flow periods.
    - Conservation pumping rules during normal flows.
    - Severe restrictions during low flows; encourage use of stored water with allocations prioritizing small growers, domestic well users, Tribal communities, and overburdened users.

Key Steps to Implementation Continued...

Hold Public Meeting to Review and Refine the Plan

- Convene water users and interest groups dependent on shallow groundwater.
- Share adaptive management plans and proposed rulesets.
- Develop and Refine tailored participation pathways for small and overburdened users based on input.

Implemen ement Plans and Monitor Performance

- Member entities publish annual water-use reports using the standardized template.
- The workgroup meets annually to review compliance; non-compliant entities may receive reduced access to regional stored water.
- Update adaptive management plans annually to reflect new hydrologic data and climate information.

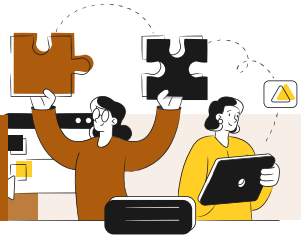
Implementation Leads and Partners

Potential Leads

- **UVRGA:** Convene Workgroup; develop area-specific management plans and pumping thresholds; ensure SGMA/GSP alignment; oversee compliance review.
- **OBGMA:** Provide basin-specific modeling and monitoring; identify high- connectivity zones; support threshold development.
- **Casitas MWD:** Lead conjunctive-use program coordination; integrate Lake Casitas storage and managed recharge; support stored water allocation during low-flow periods.
- **County of Ventura – WPD:** Expand and maintain streamflow monitoring; support watershed data and instream flow coordination.
- **VRWD, MOWD, City of Ventura - Ventura Water:** Implement pumping rules within service areas; conduct outreach; submit annual water use reports.

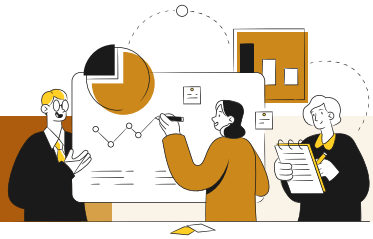
Potential Key Partners

- **VCFB / VCAILG:** Coordinate engagement and participation.
- **Landowners and Agricultural Water Users:** Participate in pumping management, reporting, and recharge opportunities.
- **Small Grower and Rural Community Representatives:** Support equitable participation and protection of shallow domestic wells.
- **Friends of the Ventura River:** Represent instream flow and habitat protection interests; provide input on flow thresholds, ecological triggers, and public transparency tools; assist with community outreach.
- **OVLC:** Provide site-level habitat knowledge; help identify high surface- groundwater connectivity zones; support monitoring and restoration aligned with pumping rules.
- **BVBMI:** Provide monitoring support as applicable.
- **Ventura Hillsides Conservancy and VLT:** Contribute conserved-land data and stewardship insights; coordinate recharge, habitat protection, and community engagement in priority areas.
- **California Trout:** Provide technical expertise on flow thresholds needed for steelhead and other aquatic species; support adaptive management tied to instream flow performance.
- **Surfrider Foundation:** Advocate for estuary and river-mouth flow protection; assist with water quality and public communication efforts.
- **California Native Plant Society:** Advise on groundwater-dependent riparian vegetation and ecological indicators for adaptive management triggers.
- **Ventura Audubon Society:** Provide input on riparian bird habitat needs; help track ecological response to flow-conditioned pumping.
- **DWR and SWRCB:** Provide regulatory guidance and funding support.



Existing Projects and Efforts to Leverage

- **Lake Casitas operations and storage flexibility:** Align conjunctive-use rules with storage, release timing, and supply flexibility at Lake Casitas to reduce shallow groundwater pumping during low-flow conditions.
- **GSP implementation and modeling:** Integrate updates from UVRGA and OBGMA to refine high surface–groundwater connectivity mapping, utilizing real-time monitoring to establish defensible pumping thresholds and quantify water-yield benefits.
- **Streamflow and groundwater monitoring network:** Expand and coordinate existing gages and well monitoring operated by the County of Ventura Watershed Protection District and member agencies to support real-time flow conditioning and adaptive triggers.
- **Ojai Valley and Ventura River recharge studies:** Advance site-specific stormwater capture and managed aquifer recharge evaluations in the Ojai Valley and lower Ventura River corridor to increase high-flow recharge opportunities.
- **Watershed coordination forums:** Utilize existing collaboration venues such as the Ventura River Watershed Council to streamline outreach, transparency tools, and adaptive management updates across agencies and stakeholders.



Implementation Metrics

- **Reduced pumping during low-flow periods:** Year-over-year decreases in extraction from shallow, river- connected wells during defined low- flow conditions.
- **Stabilized shallow well levels:** Maintained or improved groundwater elevations in high-connectivity zones, especially for domestic and rural community wells.
- **Instream flow protection:** Fewer days below ecological flow thresholds, informed by partners such as California Trout and Friends of the Ventura River.
- **Equitable participation:** Increased enrollment of small growers and overburdened users in tailored pathways and stored-water access programs.
- **Cost-share implementation:** Executed funding agreements and sustained multi-agency coordination.
- **Recharge and stormwater use:** Increased capture, recharge, and use of stored water during high-flow periods.

Funding Considerations

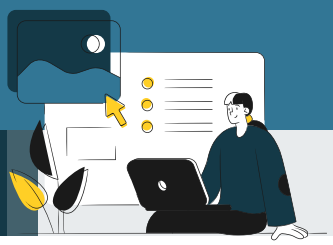
- **State bond funding (e.g., Proposition 4):** Support monitoring, modeling, recharge infrastructure, and real-time data tools.
- **DWR grant programs:** Utilize SGM Grant Program, IRWM, and drought resilience funding administered by DWR.
- **SWRCB assistance:** Seek funding and technical support from the State Water Resources Control Board, especially for overburdened communities.
- **Local cost-share agreements:** Establish proportional funding for coordination, compliance, and adaptive updates.
- **Phased implementation:** Align capital investments with grant cycles to reduce upfront burden.

Hurdles to Overcome

- **Ongoing litigation:** Consideration of legal disputes and outcomes will be important for adaptive rulemaking and require coordinated legal strategy.
- **Interconnected surface water guidance:** Evolving direction from DWR may require updates to thresholds, models, and monitoring.
- **Connectivity complexity:** Spatial and seasonal variability complicates threshold setting and trigger design.
- **Upstream–downstream impacts:** Pumping and recharge shifts may affect downstream users and instream conditions.
- **Administrative burden:** Reporting and compliance requirements may strain smaller agencies and growers.

Action 3.1.c Implementation Roadmap

Action 3.1.c: Use the Local Coastal Program's coastal-hazard zones, sea level rise projections, and shoreline adaptation strategies, along with findings from evaluations conducted as part of action 3.1.b, to guide the hardening, elevation, or relocation of critical water and wastewater infrastructure, prioritizing aging assets and sites with a history of overtopping or saltwater intrusion.



Key Steps to Implementation

Coastal infrastructure adaptation should follow a phased, adaptive pathway built on Local Coastal Program (LCP) policies and mapped coastal hazard zones.

Assessment and Prioritization

- Assess LCP coastal-hazard zones (sea-level rise, erosion, wave run-up, flood inundation, groundwater rise) with locations of water infrastructure vulnerable to overtopping, undermining, storm damage, or saltwater intrusion.
- Develop clear, infrastructure-specific thresholds that identify when and where upgrades or relocation need to occur based on climate conditions.
- Prioritize critical lifeline assets (pump stations, pipelines, intake structures, stormwater outlets, access roads) within hazard zones that necessitate retrofits.
- Where necessary, conduct site-specific vulnerability assessments using best available science.

Design and Engineering

- Apply LCP-recommended adaptation strategies (protect, accommodate, hybrid, or relocate) based on feasibility, hazard seaverity, and infrastructure lifespan.
- Develop adaptation concepts such as elevating electrical components, armoring or relocating pipelines, elevating or flood-proofing pump stations, and rerouting vulnerable access routes.
- Align designs with Coastal Act standards and LCP development policies for public facilities and coastal resource protection.

Permitting and Compliance

- Coordinate early with County Planning, Coastal Commission staff, and resource agencies to ensure consistency with the updated LCP amendments (currently undergoing certification).
- Integrate consideration of sea level rise related hazards into capital improvement plans and permit applications, as now required under Ventura County LCP policies.

Key Steps to Implementation Continued...

Implementation and Monitoring

- Prioritize shovel-ready improvements and assess required permitting needs at locations with documented past failures (overtopping during storms, saltwater intrusion episodes, undermining of outfalls).
- Use adaptive management: monitor shoreline change, estuary inlet migration, groundwater rise, and structure performance after extreme events to refine the approach over time.

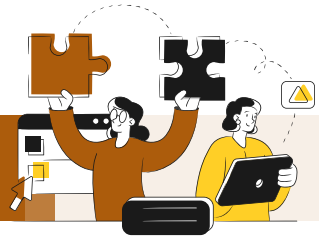
Implementation Leads and Partners

Potential Leads:

- **County of Ventura – WPD:** Lead for flood-protection facilities, outfalls, and channel- adjacent structures; supports hazard modeling and emergency response coordination.
- **City of Ventura and Casitas MWD:** Lead for potable water, wastewater, and recycled-water infrastructure within hazard zones; integrate adaptation strategies into CIP planning.
- **County Planning Division (LCP administrators):** Ensures compliance with LCP hazard policies and guides consistent application of coastal-hazard maps and SLR requirements.

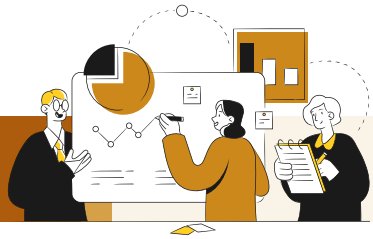
Potential Key Partners:

- **California Coastal Commission:** Permitting and regulatory compliance—particularly where relocation, armoring, or land-use changes are proposed.
- **Caltrans:** Collaboration where water facilities are adjacent to Caltrans managed roadways.
- **State Parks and City of Ventura Parks:** Coordination on jointly managed coastal lands supporting water infrastructure or access routes.
- **VC Resilient Coastal Adaptation Project staff:** Provide hazard data, sea-level rise mapping updates, and adaptation strategy recommendations.
- **Private landowners and easement holders:** Support for access, construction staging, and long-term monitoring.



Existing Projects and Efforts to Leverage

- **Site assessments and LCP-compliant designs must utilize the best available science**, such as the 2024 OPC Sea-Level Rise Guidance and Coastal Commission SLR Guidance, rather than relying on outdated projection data for CIP prioritization. These updated guidelines ensure coastal hazard planning reflects current state projections and risk scenarios. Ventura County LCP Amendments (2025 adoption) embed sea-level rise requirements directly into development review; water agencies should use these policies proactively to screen assets and design improvements that require fewer permit revisions later.
- **Coastal Area Plan hazard maps and shoreline-change datasets** help identify areas with documented overtopping, erosion, or historic flooding; these should guide early-phase prioritization of assets most at risk.
- **BEACON regional coastal adaptation work** (shoreline processes, sediment management, historical flooding) offers regional context for designing adaptation solutions that avoid unintended down-coast impacts.
- **City of Ventura's shoreline and wastewater facility upgrades** (recent planning for the VenturaWaterPure project and wastewater system hardening) provide design precedents and opportunities for cost-sharing where infrastructure is co-located.
- **The California Coastal Commission's Critical Infrastructure Sea-Level Rise Vulnerability Assessment and Adaptation Guidance** provides detailed best practices for evaluating infrastructure at risk from sea-level rise and offers recommended adaptation approaches, including protection, accommodation, and relocation strategies. It should be used to inform project design and long-term capital planning.



Implementation Metrics

Success reflects both the reduction of infrastructure risk and the incorporation of long- term climate considerations into capital planning.

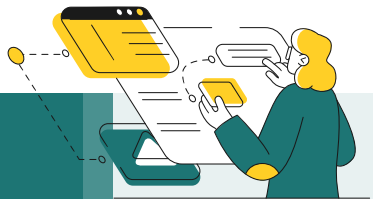
- **Number of critical assets** assessed using SLR projections.
- **Percentage of high-risk facilities** with adaptation designs completed and integrated into CIP budgets. Completion of priority upgrades (elevations, armoring, relocations) in high-hazard areas.
- **Reduced frequency of damage or overtopping** during high-tide and storm events.
- **Demonstrated compliance with LCP coastal hazard policies** in new and retrofitted projects.

Funding Considerations

Adapting coastal infrastructure requires substantial near-term investment for facilities already at-risk or facing near-term coastal-related hazards. However, these near-term costs will help to reduce long-term losses from storm damage, erosion, or service disruption. As sea-levels gradually rise, established triggers will allow for continued upgrades and retrofits which, when programmed into capital improvement planning, can help limit emergency repair costs and unanticipated, larger-scale costs.

Potential Funding Sources

- Ocean Protection Council (OPC) and SB1 Sea-Level Rise Adaptation grants, which provide targeted support for critical infrastructure, alongside State Coastal Conservancy funds for ecosystem-focused design and implementation.
- FEMA Hazard Mitigation Grant Program: Elevation, flood-proofing, and relocation of critical facilities.
- Proposition 4 (2024) Climate Resilience Bond: Eligible for water, coastal resilience, and adaptation infrastructure.
- Cal OES and BRIC funding: Pre-disaster mitigation for critical infrastructure.
- Local utility rate structures: Long-term capital planning for facility upgrades.



Hurdles to Overcome

Adaptation of coastal water infrastructure intersects with complex regulatory, funding, and engineering challenges.

Regulatory and Policy Challenges

- Multi-agency permitting involving the County, Coastal Commission, and State Parks remains lengthy for armoring or relocation, though the Ventura County RCD's programmatic permits offer a streamlined pathway for associated restoration activities.
- Local Coastal Program hazard policies emphasize avoidance and relocation where feasible; infrastructure owners may prefer hardening, requiring strong justification.

Physical and Technical Challenges

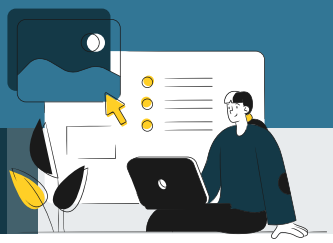
- Limited land availability inland for relocation of water and wastewater systems.
- Aging infrastructure in difficult-to-access shoreline areas complicates construction logistics.
- Future groundwater rise can undermine infrastructure even before surface inundation.

Social and Funding Challenges

- Ratepayer and community concerns regarding costs, aesthetics, or temporary construction impacts.
- High upfront capital needs for infrastructure relocation.

Action 4.1.a Implementation Roadmap

Action 4.1.a: Analyze how projected climate impacts (such as higher peak flows, increased sediment and debris transport, wildfire burn-scar runoff, and prolonged inundation) will affect flood-control facilities, municipal stormwater systems, and centralized wastewater infrastructure. Identify where systems may be exceeded under future conditions and prioritize adaptation needs such as structural upgrades, sediment-removal programs, capacity expansions, asset protection, operational improvements, and emergency-preparedness measures, with emphasis on facilities serving overburdened communities.



Key Steps to Implementation

Study Climate Impacts

- Using the latest climate projections, conduct regional studies that identify hazards and multi-hazard combinations for water infrastructure facilities
- Generate design guidance based on projected change in loading caused by hazards and hazard combinations (e.g. higher peak flows, increased sediment and debris transport, wildfire burn-scar runoff, and prolonged inundation) for relevant water resource systems.
- Develop performance metrics for climate impacts by adopting established standards from the DWR Climate Change Integrated Report and the OPC Sea-Level Rise Guidance to evaluate the resilience of relevant water resource systems.
- Itemize existing infrastructure and assets by adopting the American Society of Civil Engineers (ASCE) standardized rating system to generate interactive maps and online tools that report system health through consistent operational and maintenance performance metrics. Assess existing infrastructure and assets against updated design guidelines to establish compliance rating.

Convene Workgroups

- Based on hazard-system combinations, convene targeted workgroups to address deficiencies.
- Identify and prioritize multi-benefit improvement opportunities.

Generate Adaptation and Emergency Response Plans

- Assess failure pathways of at-risk, 'low- compliance', and other critical infrastructure.
- Develop adaptation pathways for at-risk systems (e.g., sediment management areas).
- Generate emergency response plans for communities reliant on at-risk infrastructure, ensuring these frameworks include pre- identified adaptation strategies that can be expedited through emergency permitting to bypass multi-year agency approval timelines following a disaster.

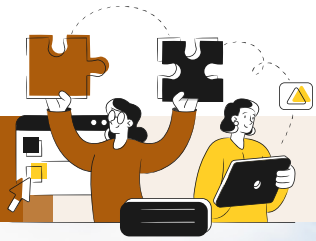
Implementation Leads and Partners

Potential Leads

- **OVSD:** Assess and plan upgrades for wastewater infrastructure
- **City of Ventura - Public Works:** Evaluate and adapt municipal stormwater and flood-control assets.
- **City of Ventura - Ventura Water:** Assess climate risks to water supply infrastructure and incorporate updated design standards.
- **County of Ventura - WPD:** Lead flood-control facility assessments and update hydrologic/design criteria.
- **County of Ventura - Public Works:** Coordinate asset inventory, interagency planning, and integration into Hazard Mitigation Plans and CIPs.

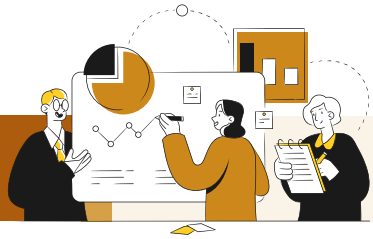
Potential Key Partners

- **Caltrans:** Coordinate adaptation of transportation drainage and related infrastructure.
- **County Parks:** Support multi-benefit project siting and public-facing resilience efforts.
- **BEACON:** Provide coordination support for regional grant applications and access to synthesized shoreline monitoring data and coastal process modeling tailored for the Santa Barbara and Ventura littoral cells.
- **OES:** Align infrastructure adaptation with emergency preparedness and response planning.



Existing Projects and Efforts to Leverage

- **Ventura County Watershed Protection District Flood Control Programs:** Existing design standards, debris-basin maintenance (e.g., Matilija Dam sediment management transition planning), and hydrologic studies for the Ventura River and tributaries (San Antonio Creek, Coyote Creek, Canada Larga).
- **Stormwater and MS4 Programs:** Municipal and unincorporated stormwater system mapping, tide gate and outfall management near the Ventura River estuary, and sea-level rise adaptation planning.
- **Ojai Valley Sanitary District Capital Improvement Planning:** Wastewater treatment and recycled water infrastructure upgrades relevant to floodplain exposure and wildfire-related sediment/debris risks.
- **City of Ventura - Ventura Water Supply and Infrastructure Planning:** Ventura River diversion facilities, Foster Park wellfield, and integration with SWP reliability planning under climate stressors.
- **Casitas Municipal Water District Dam Safety and Sediment Management Efforts:** Lake Casitas operations, dam safety reviews, sedimentation studies, and coordination tied to Matilija Dam ecosystem restoration and downstream flood capacity.
- **Matilija Dam Ecosystem Restoration Project (multi-agency effort led by Ventura County):** Sediment transport modeling, channel evolution studies, and downstream infrastructure risk assessments directly applicable to climate-driven peak flow and debris scenarios.
- **Ventura County and City Hazard Mitigation Plans:** Updated flood, wildfire, and post-fire debris flow hazard mapping specific to the Ventura River watershed and Ojai Valley.
- **Ventura County Office of Emergency Services Emergency Response Frameworks:** Existing evacuation planning, burn-scar response protocols, and interagency coordination applicable to Ventura River flood and debris-flow risks.
- **Regional IRWM Program – Ventura County Region:** Multi-benefit project funding and data-sharing platform supporting resilience upgrades in the watershed.



Implementation Metrics

- **Reduced flood risk:** Fewer flood-related damage and service disruptions along the Ventura River corridor, Ojai Valley, and lower Ventura urban areas under high-flow events.
- **Improved performance of flood control facilities:** Increased compliance ratings and reduced overtopping or sediment-related capacity loss at facilities managed by WPD.
- **Resilient wastewater and stormwater systems:** Documented upgrades and reduced failure risk at systems operated by Ojai Valley Sanitary District and City of Ventura - Ventura Water and Public Works.
- **Protection of overburdened communities:** Prioritized capital improvements and emergency planning for facilities serving vulnerable neighborhoods in the Ojai Valley and West Ventura.
- **Watershed-wide asset inventory and mapping:** Completion of a shared, publicly accessible infrastructure inventory with performance ratings and climate stress indicators.
- **Adopted adaptation and emergency plans:** Formal adoption of facility- specific adaptation pathways and emergency response plans integrated into County Hazard Mitigation Plans and Capital Improvement Programs.
- **Expanded distributed retention and storage:** Increased number of public retention basins, green infrastructure retrofits, and household- scale water storage incentives within the watershed.

Funding Considerations

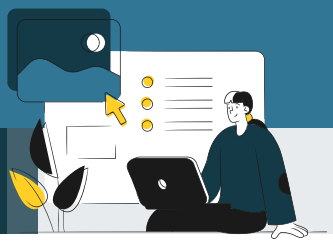
- **DWR climate and flood grants:** Pursue resilience, flood management, and IRWM funding administered by DWR to support hydrologic updates, facility retrofits, and sediment capacity improvements.
- **FEMA Hazard Mitigation and BRIC:** Leverage Hazard Mitigation Assistance and BRIC funding through FEMA for high-risk facilities and community protection projects.
- **State coastal and watershed resilience funding:** Align lower Ventura River and estuary-related projects with state resilience programs where applicable.
- **Local capital improvement programs (CIPs):** Integrate adaptation upgrades into planned CIP cycles for wastewater, stormwater, and flood control agencies to reduce standalone costs.
- **Post-disaster recovery funding:** Position pre- identified projects for rapid funding access following declared disasters affecting the Ventura River Watershed.

Hurdles to Overcome

- **Built-environment constraints:** Limited space in developed areas of Ojai and Ventura, plus private property and easement limitations, restrict expansion of channels, basins, and sediment management areas.
- **Sediment and burn-scar management challenges:** Post-wildfire debris flows from upper watershed burn scars complicate siting, permitting, and long-term sediment removal planning.
- **Permitting complexity:** Multi-agency approvals for in- channel or floodplain work along the Ventura River may extend timelines and increase costs.
- **Funding competition:** High capital costs for retrofits and upgrades compete with other regional infrastructure priorities.
- **Emergency coordination gaps:** Need for clearer alignment between infrastructure operators and the Ventura County Office of Emergency Services for flood, debris flow, and prolonged inundation scenarios.
- **Public awareness and preparedness:** Limited community understanding of infrastructure limits and flood risk, particularly in historically flood-prone areas.

Action 5.2.c Implementation Roadmap

Action 5.2.c: Develop and implement site-specific Recreation Management Plans for high-use river areas to balance public access with habitat protection in the face of more extreme precipitation, flooding, heat, and drought, and create or enhance alternative recreation hubs outside sensitive habitats to redistribute visitor pressure. Prioritize designs that protect sensitive vegetation, reduce erosion and water-quality impacts, and improve long-term ecological resilience while maintaining safe, sustainable access for the community. Leverage success of OVLC's Ventura River Preserve and incorporate lessons learned in future projects. Ensure public access priorities are incorporated into long-term implementation of the Matilija Dam Ecosystem Restoration Project (MDERP).



Key Steps to Implementation

Assess and Prioritize Sites

- Map high-use areas, informal access, sensitive habitats, erosion/vegetation impacts, and unmet recreational needs from underserved communities.
- Evaluate existing and projected future climate change risks (erosion, water quality, safety, habitat sensitivity).
- Classify sites: Protect and Harden, Redirect, or Relocate and Restore.
- Identify viable locations for alternative recreation hubs outside sensitive areas. Consider locations that serve overburdened communities.
- Establish an outreach and engagement plan to involve the broader community and interested parties, with input informing key milestones in the process.

Plan and Design Improvements

- Develop site-specific Recreation Management Plans with access design, circulation, signage, and ADA accessibility needs.
- Apply low-impact and climate proofing standards:
- Hardened access points, sustainable trails, biostabilization, native planting, and stormwater BMPs.
- Create multilingual and culturally appropriate wayfinding and regulatory signage to guide visitors toward hubs and away from sensitive stream reaches.
- Integrate safety considerations from extreme weather events and water quality exceedances; consider emergency access and evacuation routes.

Key Steps to Implementation Continued...

Build Hubs and Manage Access

- Construct or upgrade alternative hubs with parking, restrooms, shade, overlooks, and education/play features.
- Decommission informal access (social trails, ad hoc parking) and restore vegetation.
- Improve transportation access: signed routes, bike/ped links, EV charging ports, and seasonal shuttle/parking tools.
- Ensure equitable access: ADA compliance and multilingual signage.

Implement and Phase Construction

- Use programmatic permits (e.g., RCD, HCP frameworks) to streamline recurring work.
- Phase construction so hubs open before sensitive-site closures.
- Install erosion controls and revegetation immediately after access removal.

Engage Community and Support Stewardship

- Conduct co-design walks and workshops with users and Indigenous partners.
- Establish stewardship programs (trail adoption, planting days, ambassadors, youth crews).
- Provide behavioral nudges (QR info, condition updates, volunteer incentives).

Monitor, Adapt and Report

- Track performance via photo points, drone surveys, counters, parking data, water/vegetation indicators, and visitor surveys.
- Use adaptive triggers for temporary closures (bank stability, water-quality exceedances, nesting seasons).
- Provide transparent updates via dashboards and annual reports.

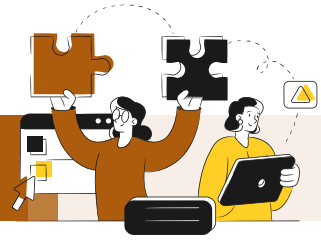
Implementation Leads and Partners

Potential Leads

- **OVLC:** Lead design/implementation on OVLC holdings; hub demonstration sites; volunteer programs; monitoring; lessons transfer from Ventura River Preserve.
- **VCRCD:** Programmatic permitting, CEQA/NEPA support, technical design standards, watershed coordination, contractor vetting.
- **County of Ventura – WPD:** Integration with flood and debris basin operations; bank stabilization alignment; hydraulic/sediment review.
- **City of Ventura / Ventura County Parks:** Public lands implementation, operations/maintenance of hubs, enforcement coordination.
- **VLT:** Lower watershed implementation; outreach; stewardship.

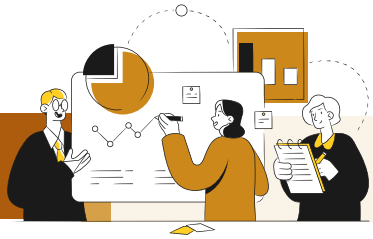
Potential Key Partners

- **CA State Parks:** Access/amenities alignment; resource protection.
- **Tribal/Indigenous partners:** Cultural resource protection; interpretive programming; co-management opportunities. Fire agencies: Safety, evacuation coordination; red flag protocols for closures.
- **Public Health / Environmental Health:** Water quality advisories; signage templates.
- **Caltrans:** ROW treatments at bridges; parking safety; stormwater controls.
- **Local landowners and neighborhood groups:** Access agreements; stewardship; conflict resolution.
- **User groups (anglers, paddlers, equestrians, MTB, trail groups):** Co-design; volunteer maintenance days.
- **Schools and community orgs:** Education and ambassador programs.
- **MDERP partnership team:** Ensure public access designs align with restoration phasing, sediment management, and habitat goals.



Existing Projects and Efforts to Leverage

- **OVLC's Ventura River Preserve:** Transfer lessons on trail hardening, social trail decommissioning, volunteer programs, and signage that effectively redirects behavior.
- **WPD bank stabilization and flood projects:** Leverage designs, hydraulic modeling, and construction windows; coordinate so improvements are complementary.
- **Programmatic permitting frameworks (e.g., RCD, HCP):** Use as the default pathway for recurring restoration and low-impact access work.
- **Community stewardship networks:** Neighborhood coalitions, volunteer groups, schools—scale up ambassadors and monitoring.
- **Existing datasets:** Drone/fixed-point imagery, vegetation mapping, trail counts—standardize into a shared monitoring dashboard.

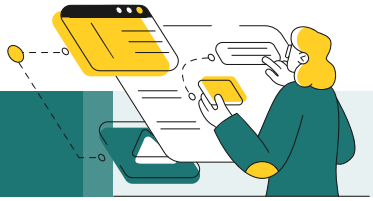


Implementation Metrics

- Percent of high-use sites with completed RMPs and implemented improvements Increased visitor use at designated hubs relative to sensitive sites, including visitors from underserved communities
- Reduced bank erosion at improved locations
- Measurable native vegetation recovery
- Decline in social trails and unauthorized access points Improved water-quality indicators at treated reaches On-schedule OandM completion and reduced incident trends
- Volunteer participation levels Public access improvements aligned with MDERP phasing Incorporation of RMP lessons into MDERP design updates

Funding Considerations

- Pair capital grants (hub build-out, hardened access, bio-stabilization) with programmatic and OandM funding.
- Use phased projects with clear performance metrics to unlock subsequent funding.
- Align RMPs with public health, safety, and equity co-benefits to diversify funding.
- State: Coastal Conservancy, WCB Streamflow Enhancement, CDFW Prop 1/Restoration, CA State Parks LWCF/ORS.
- Federal: NOAA Restoration Center, USFWS Partners, FEMA BRIC/HMGP (for erosion/flood risk), FHWA TAP (active transportation to hubs). Regional/Local: County/City park funds, stormwater/water-quality funds, philanthropic foundations.
- MDERP: Integrate access elements into restoration work packages where appropriate.

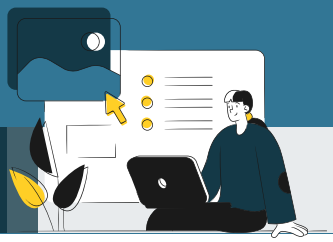


Hurdles to Overcome

- Entrenched patterns of informal river access.
- Seasonal surges (holidays/heat) stressing capacity and OandM.
- Highly sensitive vegetation and unstable banks where “no access” is the only sustainable choice.
- Limited space for parking or restrooms near desired hubs.
- Multiple jurisdictions; cultural and biological constraints; construction window limitations.
- Post-project maintenance obligations not always covered by grants.
- Capital costs for hub build-out and durable access features.
- Long-term OandM, monitoring, and adaptive management funding.

Action 6.3.a Implementation Roadmap

Action 6.3.a: Conduct a Ventura River Agricultural Runoff Vulnerability Assessment that maps and quantifies nutrient, sediment, and pesticide loading hotspots and evaluates their impacts on downstream reaches and the Ventura River estuary by land-use type, season, and storm intensity, with a focus on how these conditions are expected to change with increasing drought, extreme heat, sea level rise, and extreme precipitation. Include current and anticipated water quality impacts and their cascading community effects from agricultural upstream contributions and livestock/equine facilities. Coordinate closely with the Ventura County Agricultural Irrigated Lands Group (VCAILG) to align with existing monitoring and reporting programs, avoid duplication of effort, and ensure the assessment supports rather than replicates regulatory requirements.



Key Steps to Implementation

A robust vulnerability assessment must integrate regulatory monitoring networks, agricultural community engagement, watershed science, and agricultural land-use and management patterns.

Assessment and Data Integration

- Compile monitoring datasets from VCAILG's historical Conditional Waivers and current Ag Order programs, including Responsibility Area (RA)-specific sampling results, trend data, and exceedance notifications from both Ag Order benchmarks and TMDL load allocations.
- Incorporate VCAILG's RA boundaries, updated in 2025, which define compliance groups and determine when collective management obligations are triggered, such as required implementation of Management Practices, annual Farm Evaluations, or Management Practice Plans under TMDLs.
- Map agricultural parcels, crop types, irrigation methods, and horse facilities using GIS and land-use layers.

Hotspot Mapping and Analysis

- Analyze nutrient, sediment, and pesticide loading by leveraging VCAILG's long-term monitoring dataset (2006–present), to establish baselines for evaluating impacts under future climate projections.
- Identify pollutant source areas by vulnerable to climate change by overlaying existing storm-intensity hydrology, soil erosion potential, irrigation return flow pathways, and fertilizer application periods with projected shifts in precipitation and temperature.
- Ground-truth model outputs through targeted field verification and sampling utilizing current datasets and coordinating with VCAILG to avoid redundant monitoring.

Key Steps to Implementation Continued...

Impact Evaluation and Scenario Testing

- Evaluate downstream impacts to the Ventura River, TMDL-listed reaches (e.g., algae/nutrient impairment), and the estuary under wet- and dry-weather regimes.
- Test scenarios reflecting climate-driven extremes identified in Resilient Agricultural Lands Initiative (RALI) and WRP (e.g., back-to-back storms, post-fire runoff, prolonged drought concentrating nutrients).

Coordination and Reporting

- Work with VCAILG to ensure the assessment complements their Water Quality Management Plan (WQMP) and RA-level management practice requirements.
- Ensure assessment outputs support growers' compliance pathways under the 2023 Ag Order (INMP/INMR reporting, Track 1 or Track 2 TMDL compliance).
- Share findings with agricultural community through Farm Bureau, UCCE, RCD, and RALI engagement channels.
- Integrate outreach, education, and coordination efforts early in the process.

Implementation Leads and Partners

Potential Lead

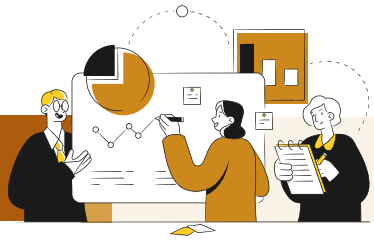
- **VCAILG / Farm Bureau of Ventura County:** Project management, regulatory alignment, access to monitoring data, outreach to growers, and integration with the WQMP.
- **VCRCD:** GIS analysis, ag/horse facility engagement, integration with Agricultural Environmental Water Quality Assistance (AEWQA) program.

Potential Key Partners

- **UCCE Ventura:** Agronomic and nutrient-management expertise; Irrigation and Nitrogen Management Plan education alignment.
- **Regional Water Quality Control Board:** Technical review; Ag Order and TMDL compliance coherence.
- **County of Ventura - WPD:** Hydrology, storm- event data, sediment modeling.
- **Horse facility operators and equestrian organizations:** Participation in source-area mapping and BMP identification.
- **Municipal Separate Storm Sewer System (MS4) permittees:** Urban runoff and estuary monitoring data.
- **RALI partners (Farm Bureau, Ag Commissioner, UC Extension, conservation groups):** Access to RALI datasets, community networks, and climate-resilient agriculture initiatives.

Existing Projects and Efforts to Leverage

- **VCAILG Water Quality Management Plan (2025):** The assessment should build directly on RA boundaries, monitoring sites, and TMDL-driven obligations to avoid duplicative sampling and reinforce compliance pathways.
- **VCAILG Monitoring and Reporting Program:** Provides consistent nutrient, pesticide, and sediment data since 2006; integrate trend data and exceedance notifications to identify priority reaches.
- **Clearwater (parcel-by-parcel RA and review platform):** Use to align hotspot mapping with actual grower parcels and responsibility areas. [farmbureauvc.com]
- **AEWQA (RCD's watershed-wide BMP funding program):** Use assessment findings to target high-impact BMP projects for up to 60% cost-share grants.
- **RALI:** Leverage RALI's mapping, climate-risk findings, and farmer engagement network to frame the assessment within broader agricultural climate-resilience goals.
- **UCCE nutrient and irrigation management training:** Align assessment outputs with INMP/INMR grower training requirements and nutrient management benchmarks.
- **MS4 and TMDL monitoring and estuary data:** Integrate lower-watershed pathogen, nutrient, and sediment data for a complete source-to-estuary analysis.
- **State Water Resources Control Board Groundwater-Surface water Model:** An integrated tool developed to simulate the relationship between groundwater levels and surface water persistence to establish instream flow requirements for steelhead.
- **State Water Resources Control Board Nitrogen Transport Model:** A framework that tracks how nutrients move through the watershed to refine nitrogen load allocations and address algae and eutrophic conditions in the river.



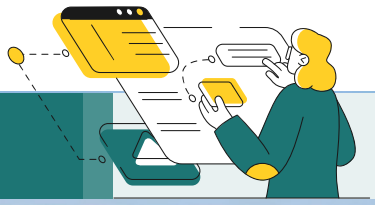
Implementation Metrics

- Completion of a watershed-wide pollutant hotspot map integrating VCAILG RA data, hydrology, and land-use patterns.
- Number of datasets integrated (VCAILG monitoring, TMDL exceedances, MS4 data, AEWQA site data, RALI spatial data).
- Field verification coverage, such as the number of sampling locations ground-truthed.
- Number of growers, ranchers, and horse-facility operators willingly participating in data collection or BMP scoping, facilitated by outreach and education efforts.
- Improved alignment with VCAILG WQMP implementation and future RA-level BMP recommendations.
- Actionable BMP opportunity maps that support future grant applications (e.g., AEWQA, SALC, Prop 4).
- Deployment of climate-informed strategies identified through the assessment (e.g., timing adjustments to fertilizer application, enhanced erosion-control measures, or targeted irrigation/BMP upgrades) in priority hotspot areas.

Funding Considerations

Upfront costs include technical modeling, GIS work, and targeted sampling, but once the baseline assessment and hotspot map are completed, ongoing costs decline significantly. The assessment will form the foundation for future BMP targeting, regulatory compliance support, and grant-funded implementation, thereby providing long-term savings for growers and agencies.

- State Water Board 319(h) Nonpoint Source Grants: nutrient, sediment, pathogen source assessments. AEWQA Program (Ventura County Resource Conservation District): existing grant funding for nutrient, sediment, and irrigation BMPs across Ventura River.
- Prop 4 (2024 Climate Resilience Bond): watershed- scale water-quality and runoff mitigation planning. CDFA Healthy Soils and Nutrient Management grants: complementary grower incentives.
- NRCS EQIP: provides farmers with financial and technical aid to implement conservation practices that enhance water quality, soil health, and climate resilience.
- RALI Implementation Grants (SALC 2024): supports resilient agricultural land-use transitions and regional agricultural infrastructure planning.



Hurdles to Overcome

Data and Access Challenges

- Private property access for sampling and obtaining parcel-level data may be difficult and requires strong VCAILG–RCD–grower coordination.
- Some nutrient and pesticide records are proprietary; anonymization protocols may be needed.
- Climate data limitations such as coarse spatial resolution and uncertainty in localized precipitation intensity or timing, may constrain the precision of runoff, erosion, and nutrient-loading projections at the parcel or sub-watershed scale.

Regulatory and Coordination Challenges

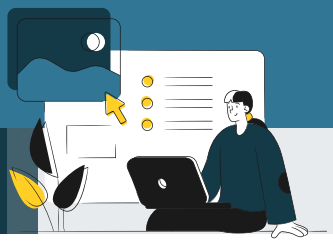
- Avoid duplicating VCAILG's existing monitoring efforts and reporting; early, continuous coordination and adaptive management.
- Growers may be wary of assessments perceived as punitive; clear messaging via VCAILG and RALI networks is essential.

Technical Challenges

- Storm-driven pollutant pulses vary widely, requiring multi-scenario modeling and high-resolution hydrology.
- Post-fire sediment and nutrient export complicates attribution in certain years.

Action 7.1.b Implementation Roadmap

Action 7.1.b: Using the coordinated data systems and data-management subgroup established in Action 7.1.a, develop a watershed-scale ecological monitoring framework to track climate-driven change and inform adaptive management across upland, riparian, and aquatic habitats. Build on existing monitoring programs and integrate appropriate indicators, including wildfire-driven vegetation change, post-fire sediment and debris dynamics, and sea level rise and storm surge effects on estuary and coastal habitats. Incorporate Traditional Ecological Knowledge where consented, to support restoration, land management, and protection of ecosystem and cultural resources.



Key Steps to Implementation

Climate-responsive ecological monitoring requires coordinated methods, shared data infrastructure, and multi-habitat indicators that can detect both long-term change and short-term impacts.

Assessment and Framework Development

- Inventory and synthesize existing ecological monitoring efforts (riparian, aquatic, estuarine, upland) conducted by OVLC, WPD, RCD, State Parks, local Tribes, and other organizations. Evaluate gaps in monitoring related to climate-change indicators.
- Integrate datasets generated under the Ventura River Watershed Riparian Resilience Program, which includes multi-species, invasive-species, and habitat monitoring across the watershed.

Indicator Selection and Methods

- Develop a cross-habitat set of indicators reflecting ecosystem health, climate sensitivity, and adaptive-management needs: Riparian indicators: canopy cover, invasive species extent, recruitment of native vegetation, groundwater-dependent ecosystem (GDE) condition.
- Aquatic indicators: baseflow persistence, stream temperature, benthic macroinvertebrates (BMI), steelhead passage metrics, sediment mobility.
- Upland indicators: post-fire vegetation trajectories,erosion susceptibility, slope stability, shrubland recovery.
- Cultural resource indicators (developed with Tribal partners): TEK-guided species observations, phenology, resource availability linked to cultural practices.

Key Steps to Implementation Continued...

- Biological indicators: Population trends of keystone and sensitive species, including Southern California Steelhead abundance, California red-legged frog occupancy, and avian nesting success as proxies for broader ecosystem health and connectivity.
- Climate indicators: Water supply, drought frequency and duration, sea level rise, extreme heat, wildfire risk, fog conditions, etc.

Standardize protocols and establish a QA/QC and data-management plan shared across agencies.

Monitoring Implementation

- Deploy a watershed-wide monitoring schedule with seasonal, event-based (e.g., post-storm, post-fire), and annual metrics.
- Integrate remote sensing (e.g., WPD's LIDAR and GIS datasets) for vegetation change detection, sediment movement, and stream morphology.
- Engage community scientists and TEK practitioners, with pathways for culturally appropriate data sharing.
- Adaptive Management and Knowledge Sharing
- Establish a standing technical team (WRP Advisory Group + land managers) to review data annually and recommend habitat restoration, species-specific interventions, and bank-stabilization or flow strategies.
- Create "trigger points" (e.g., temperature thresholds, canopy loss levels) that automatically prompt management actions.
- Facilitate knowledge sharing by developing a centralized, user-friendly data portal—built on existing platforms such as the WPD GIS Data Hub—to provide partners, Tribal governments (as consented), and community scientists with consistent access to ecological datasets, monitoring results, and decision-support tools.

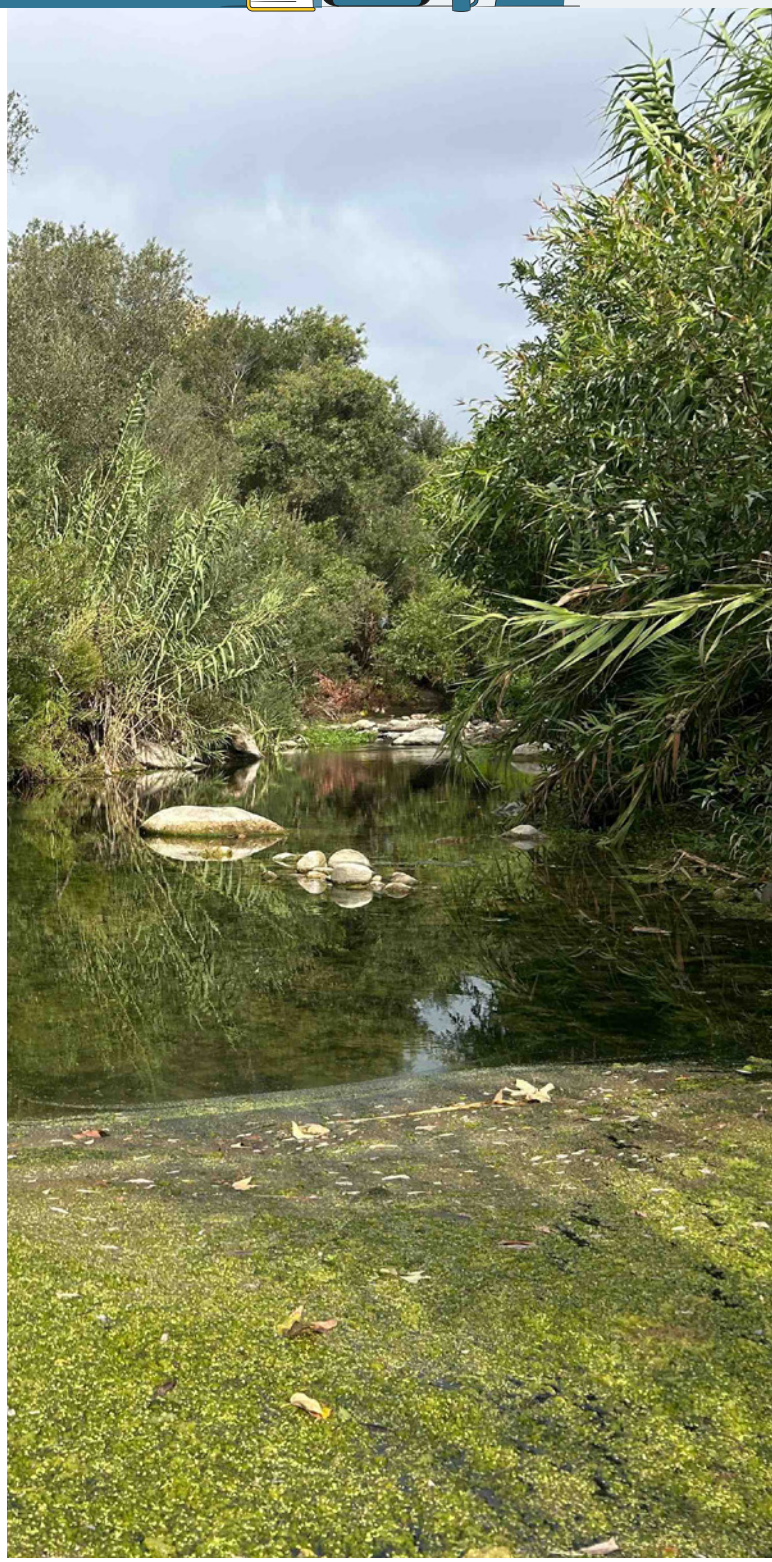
Implementation Leads and Partners

Potential Leads

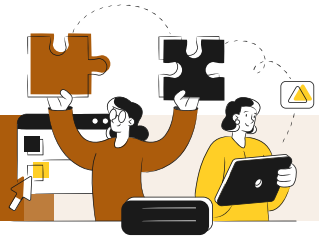
- **Ventura River Watershed Council:** Existing collaborative network serving the watershed, integrating sectors and stakeholder groups.

Potential Key Partners

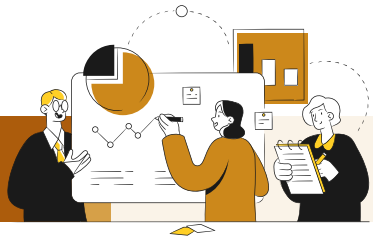
- **VCRCD:** Framework coordination, data synthesis, community monitoring tools.
- **County of Ventura – WPD:** Hydrologic, geomorphic, and GIS data provision.
- **OVLC/VLT:** On-the-ground habitat monitoring, riparian/floodplain restoration sites.
- **CDFW:** Species-status data, ecological survey guidance, and alignment with riparian resilience program.
- **Local Tribes (with consent):** Integration of Traditional Ecological Knowledge, culturally important species and phenology indicators.
- **State Parks and U.S. Forest Service:** Upland and backcountry monitoring coordination.
- **Academic partners (UCSB, CSU, UC ANR):** Methodology development, long-term climate-ecology research.
- **Community groups and volunteers:** Photo-point monitoring, iNaturalist observations, and seasonal surveys.



Existing Projects and Efforts to Leverage



- **Ventura River Watershed Riparian Resilience Program** (10-year initiative) — already performing species and habitat monitoring across multiple riparian corridors; this should form a backbone for riparian indicators and invasive-species tracking.
- **WPD GIS and Hydrology Data Hub:** provides LIDAR, flow data, and mapping tools to track geomorphic change, vegetation shifts, and hydrologic connectivity.
- **DWR Watershed Resilience Program pilot:** establishes performance indicators and monitoring expectations for watershed-scale climate resilience planning; the ecological monitoring framework should align directly with these metrics.
- **Land trust restoration sites (OVLC, VLT):** long-term vegetation plots, wildlife monitoring, and photo-points that can anchor habitat trend analysis.
- **Community science programs:** iNaturalist observations, volunteer weed-pull monitoring, and local bird and amphibian surveys.
- **Tribal environmental departments:** guidance on cultural-indicator monitoring and climate-sensitive culturally significant species.
- **CDFW State Wildlife Action Plan (SWAP):** Provides a regional conservation framework that identifies the Ventura River as a priority for conserving "Native Freshwater Aquatic Species Assemblages" and "Riparian Forest and Scrub," offering specific strategies to mitigate climate-driven stressors like altered hydrologic regimes and habitat fragmentation.



Implementation Metrics

Successful implementation is measured by the coverage, consistency, and integration of ecological monitoring across habitats.

- Completion of a watershed monitoring framework with standardized protocols across riparian, aquatic, and upland zones.
- Number of partner datasets integrated (e.g., riparian resilience program, WPD data hub, land trust vegetation plots).
- Monitoring coverage across priority reaches and representative upland and riparian sites.
- Annual ecological condition reports that identify trends, climate impacts, and priority adaptation actions.
- TEK integration measured by Tribal participation and culturally guided indicators, where consented.
- Adaptive-management decisions enacted in response to threshold exceedances or ecological triggers.

Funding Considerations

Initial investment focuses on framework design, indicator selection, and building shared data systems. Once established, annual monitoring costs stabilize and become predictable, with long-term savings realized through earlier detection of ecological decline and more targeted, cost-effective restoration.

Potential Funding Sources

- Proposition 4 (2024) Climate Resilience Bond, supporting monitoring and ecosystem adaptation.
- State Coastal Conservancy and Wildlife Conservation Board habitat-monitoring and restoration funds.
- CDFW riparian restoration funding, including ongoing support connected to the Riparian Resilience Program.
- DWR Watershed Resilience Program grants, emphasizing metrics and cross-sector monitoring.
- Federal sources: USFS, NOAA, USFWS climate-adaptation funds.
- Local philanthropy and land-trust grants for community science and upland monitoring.
- Cost sharing opportunities with stakeholders already implementing existing projects/efforts, as discussed below.

Hurdles to Overcome

Coordination and Data Sharing

- Different agencies use different monitoring methods; harmonization requires negotiation and training.
- TEK indicators require rigorous Tribal consultation and respected data-sovereignty agreements.

Funding and Capacity

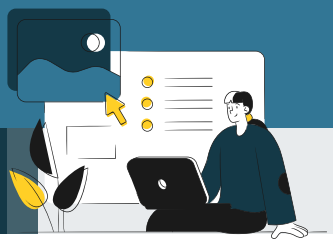
- Long-term ecological monitoring requires investment beyond project-based cycles.
- Remote-sensing analysis and climate-driven modeling require technical expertise and consistent staffing.

Technical Challenges

- High interannual variability can obscure climate-driven trends without a multi-year dataset.
- Post-fire and post-storm disturbances require flexible monitoring schedules and rapid mobilization.

Action 8.3.a Implementation Roadmap

Action 8.3.a: Improve Tribal access to culturally significant sites, traditional gathering areas, and subsistence resources across public and privately owned lands and waters, especially where climate change-driven flooding, drought, wildfire, or altered streamflows affect access. Work with Tribal governments, land managers, and landowners to identify priority locations and establish access protocols, agreements, or co-management approaches that protect cultural integrity and support continued gathering for food, medicine, materials, and ceremony.



Key Steps to Implementation

Improving Tribal access to culturally significant sites, traditional gathering areas, and subsistence resources will require coordination and a long-term commitment across a broad sector of entities in the Watershed and will take time as relationships, trust and protocols are established. The steps below outline a plan to successfully achieve this.

Build Meaningful Relationships

Initiate and sustain relationship-building between local Tribes, Tribal leadership, and cultural practitioners, in coordination with interested watershed land managers and landowners. Engagement should begin with listening and understanding Tribal priorities regarding access to culturally significant sites and traditional gathering areas.

Establish Leadership Structures and Protocols

Clarify preferred leadership structures (Tribal-led, agency-supported, or co-led) and establish mutually agreed-upon protocols for handling culturally sensitive information. These protocols should define how culturally significant knowledge is protected and how access planning can proceed without compromising cultural integrity.

Identify Priority Access Areas

Work with Tribal leadership and cultural practitioners to characterize watershed-scale access needs for culturally significant landscapes, gathering areas, and subsistence resources. Identify general geographic areas, resource types, and climate-related vulnerabilities without requiring parcel-level inventories or public disclosure of sensitive site information.

Support Shared Learning and Understanding

Strengthen understanding among Tribal representatives, agencies, and participating landowners of Tribal engagement practices, climate resilient stewardship approaches, and the history of exclusion from traditional gathering areas. Shared understanding can help reduce barriers and support durable access agreements.

Key Steps to Implementation Continued...

Identify Access Pathways

Conduct a high-level assessment of land ownership and management categories across priority landscapes (e.g., public agency lands, conservancies, private lands). Identify willing partners and evaluate which agreement mechanisms may be appropriate for different land types. This step translates priority needs into realistic access pathways.

Develop and Pilot Access Agreements

Work with willing landowners or agencies to develop and formalize access agreements (e.g., MOUs, easements, and cooperative stewardship arrangements). Where appropriate, begin with demonstration sites that can serve as case studies for future expansion. Develop templates and guidance documents to streamline future agreements.

Institutionalize, Fund, and Scale the Framework

Establish long-term coordination mechanisms, staffing roles (e.g., Tribal liaison or stewardship coordinator), and succession planning to ensure continuity and long- term planning. Identify funding pathways to support expansion of access and restoration where needed.

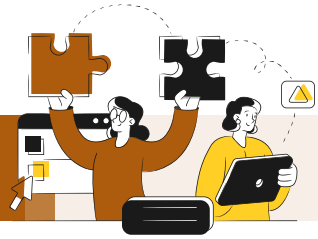
Implementation Leads and Partners

Potential Leads

- **Designated Tribal leaders or representatives:** Lead or co-lead identification of priority access needs, define cultural protocols, and guide the development of formal agreements and frameworks.
- **Land-managing agencies or conservancies** (e.g., OVLC, Ventura County, State Parks): Co-lead site-specific agreement development, support implementation, and help identify funding pathways.

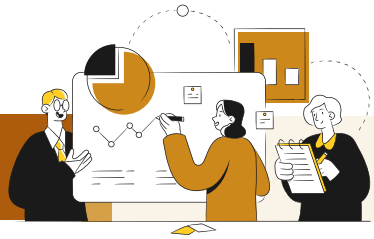
Potential Key Partners

- **VCRCD:** Support convening and coordination; assist leads with framework development, facilitation of agreements, and funding identification.
- **Willing private landowners:** Provide access to priority landscapes and participate in establishing access agreements.
- **Legal and land-management advisors:** Provide legal counsel, conservation easement expertise, and land-status clarification for drafting agreements.



Existing Projects and Efforts to Leverage

- **OVLC's Rancho Cañada Larga Conservation Partnership:** The Trust for Public Land recently acquired the 6,500-acre Rancho Cañada Larga and is in the process of transferring the property to OVLC. OVLC and TPL are working with BVBMI on a cultural easement, which demonstrates how voluntary conservation agreements can incorporate early Tribal consultation and cultural access provisions. This model can inform future access agreements and stewardship arrangements
- **Matilija Dam Ecosystem Restoration Project (MDERP):** MDERP's multi-agency coordination framework and long-term ecosystem restoration focus create opportunities to integrate Tribal stewardship and access considerations into planning and management in the upper watershed.
- **Partnerships among Land Conservancies and Stewardship Organizations:** Entities such as OVLC, Ventura Land Trust, and Ventura County RCD maintain long-standing stewardship capacity and relationships with landowners. These organizations may serve as early partners for pilot access agreements and demonstration sites.
- **Ventura River Watershed Council:** The watershed network provides a forum to coordinate with willing land managers, support Tribal access partnerships, and identify funding opportunities.



Implementation Metrics

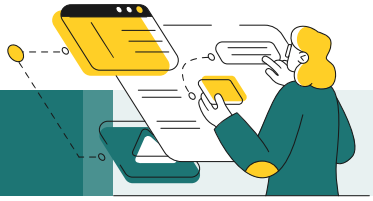
- Established inventory of priority access needs and opportunities within the watershed
- Development of guidance and templates to support access agreements
- Number of formalized access agreements (e.g., MOUs, easements, cooperative stewardship arrangements)
- Number of acres or sites where culturally appropriate access is established/restored
- Number of participating landowners or agencies engaged in access agreements
- Secured funding or dedicated staffing to support long-term coordination and implementation

Funding Considerations

Anticipated costs include staff time for relationship-building, coordination, and development of access agreements. Additional expenses may involve legal review, land surveys or documentation support, and ecological or biological expertise to inform site conservation and monitoring. Ongoing liaison capacity will also be needed to maintain agreements and support continued Tribal access and stewardship.

Potential Funding Sources

- State grants supporting Tribal stewardship and habitat restoration (e.g., California Natural Resources Agency Tribal Nature-Based Solutions Grant Program, Coastal Conservancy Tribal Capacity Building Program)
- Philanthropic foundations supporting Indigenous land access and stewardship
- Local open space or conservation funding
- Tribal capacity-building funding programs



Hurdles to Overcome

- **Trust and Relationship Building:** This process takes time and can't be rushed.
- **Protection of Sensitive Information:** Sacred cultural sites and assets may not be appropriate to share with the public. Need to prevent broad access to this information.
- **Capacity and Staffing Limitations:** Tribal governments and non-profit entities may lack the staffing and capacity to help carry out these activities.
- **Ecological Stewardship Alignment:** Not all entities, including Tribes, share the same goals and priorities for stewardship efforts.
- **Institutional and Liability Constraints:** Public agencies and private landowners may require formal agreements that address liability, insurance, and internal policy requirements before granting access. Navigating these processes can extend timelines.

Chapter 7

Performance Indicators for Watershed Resilience

This chapter introduces indicators that track how watershed conditions change over time and measure progress toward resilience goals. The indicators support adaptive management, transparent reporting, and community engagement by showing where conditions are improving or where more action is needed.

Introduction

This chapter identifies watershed-scale resiliency indicators to track whether the Ventura River Watershed Resilience Plan (VRWRP) is achieving its intended long-term outcomes for people, ecosystems, and infrastructure. These indicators complement the action-level implementation metrics in Chapter 6. While implementation metrics track delivery of individual tasks (e.g., acres treated, meetings held), the resiliency indicators and metrics in this chapter measure broader system conditions and watershed-scale resilience outcomes, offering "vital signs" of watershed health for managers to consider through VRWRP implementation.

The indicators are organized by the VRWRP's eight goals and aligned with the Department of Water Resources (DWR) Watershed Resilience Framework and Watershed Hub Resilience Indicators & Metrics guidance. This alignment supports statewide consistency, incorporation of equity lenses, and compatibility with dashboard-based reporting tools used across California.

The Watershed Council may use these indicators to produce an annual VRWRP progress report and maintain a simple online dashboard. This process provides a shared understanding of watershed conditions, strengthens adaptive management, and supports potential grant reporting requirements.

Alignment with Statewide Indicators & Existing Local Monitoring

The VRWRP indicators align with DWR's Watershed Hub resilience categories so local tracking can plug into statewide reporting tools. This ensures the Ventura River Watershed is speaking the same "performance language" as the California Water Plan and can demonstrate progress in terms familiar to funders and regulators.

The watershed already has strong monitoring programs that support can support the tracking of these indicators, including:

- **Groundwater & water supply**: Data collected by the Upper Ventura River Groundwater Agency (UVRGA) and the Ojai Basin Groundwater Management Agency (OBGMA).
- **Hydrology & floods**: United States Geological Survey and Ventura County Watershed Protection District stream gages and storm monitoring.
- **Water quality & ecology**: Ventura Countywide Stormwater Quality Management Program monitoring, Ventura County Agricultural Irrigated Lands Groups monitoring, MS4 programs, 303(d) listings, UVRGA temperature and water quality monitoring, State Water Resources Control Board GeoTracker database, Channelkeeper Stream Team sampling, Surfrider Foundation's Blue Water Task Force, and land-trust ecological monitoring.
- **Equity & community vulnerability**: The Vulnerable Communities Platform, CalEnviroScreen, and local demographic datasets.

Remaining gaps, such as routine estuary habitat mapping, academic institution partnerships through OVLC's Special Use Permit (SUP) program for specialized regional research initiatives, recreation access tracking, USGS Post-Wildfire Debris-Flow Hazard Assessment viewer for assessing wildfire-related debris flow risks, subsidence monitoring, integrated groundwater-surface water modeling, and culturally appropriate data for Tribal partners, can be filled over time through project-based monitoring or targeted grants.

VRWRP Indicators

The resiliency indicators presented below build on the strategies and actions refined in **Chapter 6**: Adaptation Strategies, Actions, and Implementation Roadmaps by shifting the focus from implementation steps to watershed-scale outcomes. While the Implementation Roadmaps describe how partners will carry out priority actions, the indicators in this chapter describe how the watershed will change as those actions take effect. Together, they provide a consistent way to track long-term resilience across the Ventura River Watershed and provide alignment with DWR's Watershed Resilience Indicators and Metrics.

To help partners clearly see how each indicator supports the goals of the VRWRP, the table below links every indicator to the VRWRP's eight climate adaptation goals:

- **G1** – Ecosystem Health is Strengthened Watershed Wide
- **G2** – Water Supply is More Reliable and Water Infrastructure is More Climate Resilient
- **G3** – Communities, Infrastructure and Ecosystems are Protected from Erosion, Flooding, and Shoreline Change Driven by Sea Level Rise and Storm Surge
- **G4** – Flood and Erosion Risks to Communities, Infrastructure, Water Quality, and Ecosystems from Extreme Precipitation are Minimized
- **G5** – Recreational Access for Community Enjoyment is Protected and Enhanced
- **G6** – Agricultural Practices are Adapted to the Effects of Climate Change and Sustain a Thriving Local Economy and Ag-Based Livelihoods
- **G7** – Coordinated Watershed Resilience is Strengthened Through the Improvement of Governance, Funding & Monitoring Tools
- **G8** – Native Leadership and Indigenous Knowledge Strengthen Climate Resilience of Cultural Resources, Sacred Sites, Subsistence Areas, and Heritage Assets

The matrix shows which indicators align with which goals, allowing users to see how ecological, hydrologic, climate, cultural, and governance indicators collectively measure progress. Example metrics are included to illustrate how each indicator may be monitored. Some indicators support a single goal while others contribute to multiple goals, reflecting the interconnected nature of watershed resilience.

Indicator	Example Metrics	G1	G2	G3	G4	G5	G6	G7	G8
Algal Stream Condition Index (ASCI)	ASCI score based on benthic algal community condition	✓							✓
CalEnviroScreen	20 indicators across exposure, environmental effects, sensitivity, and socioeconomic factors		✓	✓	✓	✓	✓	✓	✓
California Rapid Assessment Method (CRAM)	CRAM wetland/riparian condition score (buffer, hydrology, physical structure, biotic structure)	✓							✓
California Stream Condition Index (CSCI)	CSCI score as defined by statewide bioassessment methods	✓							✓
Cold water refugia / stream temperature trends	Continuous summer stream temperature; days exceeding thermal thresholds at predetermined sites	✓							
Connectivity for steelhead migration	Miles of stream accessible to anadromous fish; number and location of passage barriers	✓							
Debris flow susceptibility	Assess post-fire landscapes for debris flow risk				✓				
Flood risk for assets (coastal and inland)	Asset exposure to 100-year flood events			✓	✓				
Flood risk for people (coastal and inland)	Population exposure to 100-year flood events			✓	✓				
Funding landscape	External funding secured; funds leveraged	✓	✓	✓	✓	✓	✓	✓	✓
Groundwater levels	Groundwater level trends over a representative monitoring network		✓				✓	✓	
Heat and drought resilience	Number of orchards in operation; acres of irrigated agricultural lands in operation						✓		
Invasive plant species distribution	Acres or % cover of *Arundo donax* and other invasives in priority reaches	✓							
Communities vulnerable to climate hazards, as depicted through the Vulnerable Communities Platform	Number of people living in highly vulnerable communities; number of projects or dollars invested in these communities		✓	✓	✓	✓	✓	✓	✓
Potential disruption in supply during drought	Number of dry wells		✓				✓	✓	
Recreational area usage	Park visitation rates; program participation					✓			
Reliability of recreational access	Days river access points and trails are open; water quality conditions					✓			
Reliability of water supply for beneficial uses	Domestic water supply reliability, including Lake Casitas level trends and instream flows		✓				✓	✓	

Indicator	Example Metrics	G1	G2	G3	G4	G5	G6	G7	G8
Sea level rise risk	Exposure to coastal flooding, shoreline retreat, estuary condition, infrastructure sensitivity			✓					
Strength and presence of Tribal partnerships	Funding allocated for Tribal organizations; number of partnerships								✓
Water conservation and efficient use	Average annual urban water use		✓						

Using Indicators in Implementation

Implementation of the VRWRP will be carried out by the many partners identified in Chapter 6, with the Watershed Council serving as the coordinating body that maintains alignment on shared goals and helps track progress toward achieving them. The Watershed Council's role is not to implement every action, but to support collaboration through topic-specific working groups, maintain the indicator dashboard, and facilitate regular review of watershed-wide conditions. By making these indicators publicly accessible, the dashboard also serves as a tool for transparency, allowing community members, Tribes, and partner agencies to see how watershed conditions are changing and how management actions are performing over time. This shared visibility helps strengthen accountability and builds trust in collaborative decision-making.

Indicators help partners:

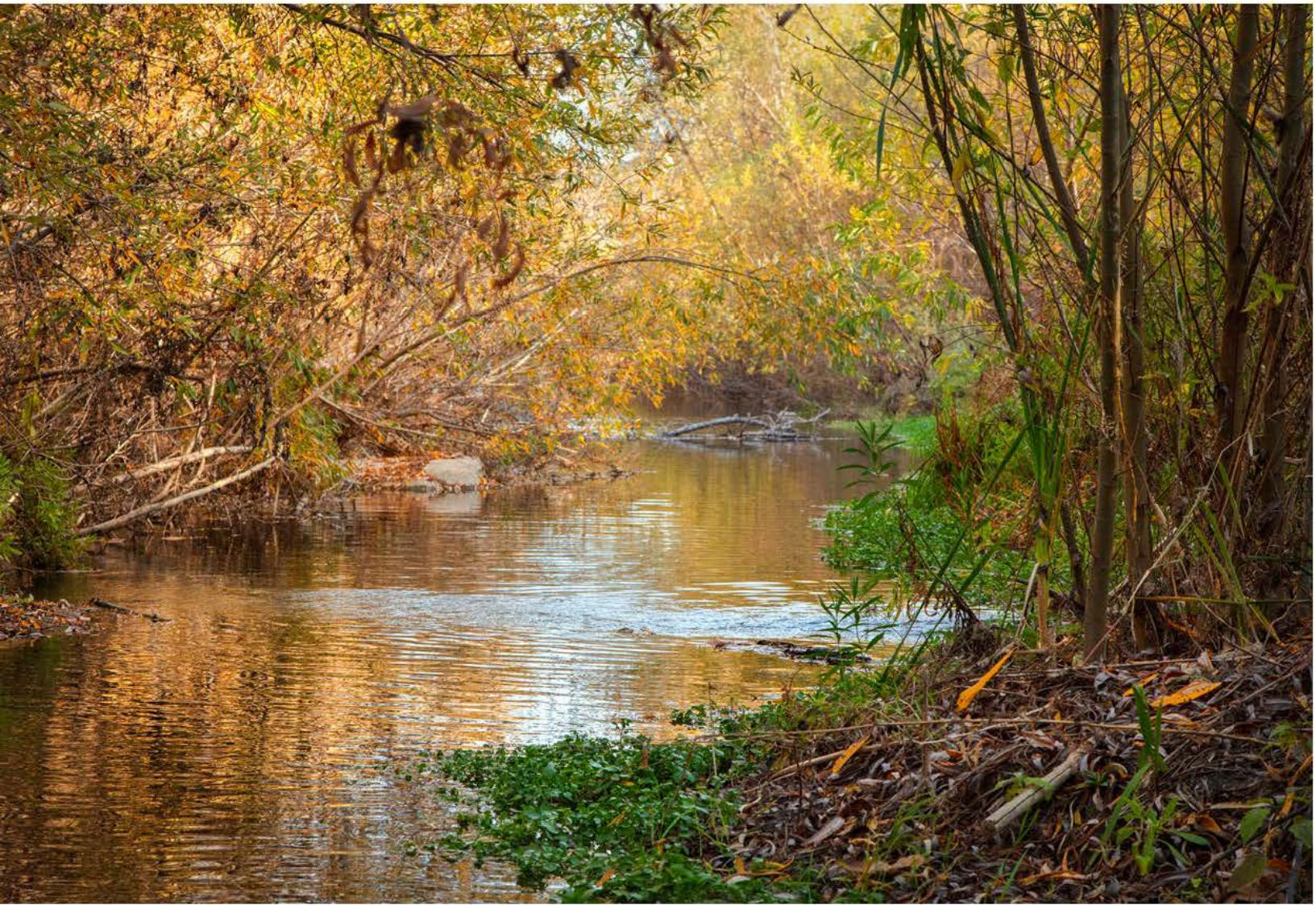
- Understand how individual projects contribute to watershed-scale outcomes,
- Adjust priorities through adaptive management when trends reveal emerging risks or unmet needs, and
- Identify where cross-agency coordination is needed—for example, when indicators show persistent water-quality exceedances or localized flood-risk hotspots.

Maintaining a consistent indicator set also strengthens the watershed's competitiveness for state and federal funding. Many grant programs now require clear baseline conditions, measurable outcomes, and demonstrated capacity to track results. By compiling indicator updates in an annual VRWRP progress report, the region can clearly show need, document benefits, and demonstrate a resilient, performance-based approach, making grant proposals more compelling and fundable.

Chapter 8

Recommendations and Next Steps

This chapter outlines key recommendations and next steps to advance implementation, emphasizing coordinated governance, inclusive partnerships, sustained funding strategies, and adaptive management through ongoing monitoring and collaboration.



Recommendations and Next Steps

Successful implementation of the VRWRP will rely on strong collaboration across agencies, Tribes, and community organizations. The Ventura River Watershed Council is well-positioned to serve as the long-term convener and coordinator of this work, helping maintain alignment on shared goals, steward collaborative tools, and support collective progress. The following recommendations outline priority actions to strengthen the watershed network and advance VRWRP implementation.

Strengthen Multi-Agency Coordination Through the Watershed Council

Strengthen the position of the Watershed Council as the central forum for watershed-wide coordination, ensuring consistent communication across jurisdictions, sectors, and organizations. Distributing leadership roles, identifying shared priorities and strengthening partnerships will reduce over-reliance on a small set of partners and improve the network's ability to address shared climate challenges. Continued support for collaborative planning efforts like the VRWRP will help maintain a common foundation of goals.

Maintain and Evolve Network Tools as Living Resources

Utilize and reference the watershed's collaborative tools, including the Kumu network map and organizational profiles, to supplement existing collaboration and partnerships. Update and maintain these tools, as needed. These tools can support information-sharing, partner matching, and cross-sector coordination. Regular updates to the tools will ensure they reflect current partnerships, data, capacities, and needs.

Expand Inclusive Participation & Strategic Partnerships

Expand the watershed network by better engaging underrepresented and less-connected organizations (including Tribal governments, small community-based groups, farms, and domestic well users) and supporting their participation through targeted training, technical assistance, and funding navigation. At the same time, deepen partnerships with Tribal governments and representatives, private landowners, land conservancies, grassroots groups, youth initiatives, research institutions, and state and federal agencies to broaden implementation capacity and incorporate diverse knowledge systems.

Coordinate Funding Strategies & Pursue Large-Scale Resilience Investments

Develop a coordinated, multi-agency funding strategy that positions the watershed to compete effectively for Proposition 4 and other large-scale state and federal investments. Align priority actions with upcoming solicitations, identify joint funding opportunities, and support readiness for multi-benefit project proposals. Investing in both key anchor organizations and smaller, less-connected partners will strengthen overall network resilience and reduce funding disparities.

Establish an Annual Progress Reporting Process for Adaptive Management

Following adoption of the VRWRP, convene an annual progress (convened through the Watershed Council) reporting meeting to review progress on strategy and action implementation, provide an update on performance indicators, and recalibrate priorities based on emerging conditions. This regular touchpoint will provide transparency, reinforce collaboration, and help partners adjust strategies as

climate, ecological, and community needs evolve. The Watershed Council can maintain a simple public-facing dashboard to track watershed-scale conditions and communicate progress year over year.

Follow a Clear Near-Term Timeline for Plan Adoption & Early Implementation

In the immediate term, complete public review, finalize the VRWRP, and update the Council Charter to reflect implementation roles. Convene working groups to refine early action priorities, assess funding opportunities, and prepare near-term implementation roadmaps. By June 2026, the Council will vote on plan adoption, updated governance structures, and initial implementation priorities.

Maintain the Watershed Resilience Plan as a Dynamic Resource

The VRWRP is a valuable resource reflecting a comprehensive, collaborative and intentional planning process made possible through the Watershed Resilience Pilot Program grant from DWR. To help ensure long-term relevance and successful implementation of the strategies and actions outlined in the VRWRP, engage targeted working groups focused on achieving and monitoring specific actions. These groups will support the work of the Coordinator and the Watershed Council's Leadership Committee in monitoring the ongoing performance of the VRWRP.

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