

Signs and murals encourage stewardship. The Ventura County Watershed Protection District erected six "Ventura River Watershed – Keep it Clean" signs near drainages in the watershed. The City of Ojai erected 10 "Do Not Dump, Drains to Ocean" signs near drainages within the City. The Ventura Hillsides Conservancy facilitated the installation of a beautiful mural along the bike path—a reminder that the health of the watershed is in our hands.

## 2.3.2.3 Highlights from Existing Projects, Programs, and Practices

Here are a few selected highlights from the watershed's ongoing projects, programs, and practices connecting the community with the Ventura River—and with each other.

## 2.3.2.4 Proposed Projects and Programs

The types of projects and programs below would advance the intent of the River Connections Campaign. Some of these projects are planned and some are already being implemented to some degree. These projects and programs can also be found summarized in table format in "2.4.2 Priority Projects and Programs."

## Establish New/Upgrade Existing River Access Opportunities

- Ventura River Parkway. The vision of a "Ventura River Parkway" is being pursued by a number of stakeholders. The Parkway would create a continuous network of publicly accessible trails, vista points, and natural areas along the river, from the coast to Matilija Canyon. Much of the land that would be involved is in private ownership. Parkway supporters hope that by working with willing landowners on a voluntary basis over time a parkway will take shape that will yield the many health, quality of life, and economic benefits seen in other communities that have a river parkway.
- **Prevent Illegal River Bottom Camps.** Continue the effort to ensure that river bottom camps in the lower river are not established. Collaborators include the City of Ventura's Community Development Dept., Public Works Dept., Fire Dept. & Police Dept.; Ventura County Sheriff, Ventura County Watershed Protection District, Taylor Ranch, State Parks, and Ventura Hillsides Conservancy.
- **Cleanup Petrochem.** The blighted and abandoned oil refinery has marred the view and threatened the water quality of the lower Ventura River for decades. Work to have the facility removed and cleaned up by the responsible parties.
- Land Protection & Public Access. Acquire land or conservation easements from willing landowners that can provide public access to the river's habitats. As part of this effort, work with the Ventura County Planning Division to help make the conservation subdivision process as efficient and inexpensive as possible.
- New Trails. Install sustainably designed new trails and look for appropriate opportunities to serve different types of trail users (walkers, hikers, ADA, bicycle, equestrian).

- New Family Picnic Areas. Look for opportunities to install vehicleaccessible parks and picnic areas that offer family access to aquatic habitats.
- Maintain and Improve Existing Trails and Access Locations. Make improvements to existing trails and access locations, such as by expanding access by different types of trail users (walkers, hikers, ADA, bicycle, equestrian). Continue to keep trails accessible and safe, and increase efforts to reduce erosion and related sediment inputs into waterways.

## Engage the Community and Encourage Stewardship

- Interpretive Signs. Install and maintain watershed interpretive signs at special/high profile watershed locations and easily accessible river viewpoints.
- **Trail Guides.** Create and distribute trail guides that describe not only the trails and access points, but also the watershed's ecosystems and the important services and values they provide.
- Ventura River Stream Team Citizen Monitoring Program. Continue this citizen water quality monitoring program that provides important long-term water quality data throughout the watershed, while empowering, educating and engaging residents.
- Steelhead Preserve Education and Conservation Center. Develop a comprehensive watershed education center at the 70-acre historic Hollingsworth Ranch along the Ventura River between Ventura and Ojai. At the Center, displays and demonstrations will interpret and animate the natural and cultural history of the watershed, and community and educational events will be hosted. The center will also be a place for students, groups, researchers and agencies to collaborate on and conduct scientific studies.
- Watershed Literacy. Continue and expand education programs that improve understanding of watershed issues (e.g., hydrology, source water, regulations, functions and value of healthy ecosystems, value of agriculture).
- Youth Education. Continue to engage youth in the watershed, such as the "Once Upon a Watershed" education program and youth camps that take youth out to nature.
- Watershed Curriculum. Develop a Ventura River watershed curriculum using the maps and information developed for the watershed management plan. Distribute to local public and private schools.
- Watershed Stewardship Opportunities. Continue and expand opportunities for citizens to learn about good stewardship and participate directly in stewardship projects.

## **Work Together**

Facilitate communication and collaboration among those already working on efforts to engage the community with the river and its issues, and to provide more direct experiences with the river. Look for opportunities to support one another's work, learn from each other, leverage resources and craft a smarter, more integrated approach to the task.

## 2.3.2.5 Organizations

The following organizations and entities are actively supportive of the intent of the River Connections Campaign.

California Coastal Conservancy California State Parks Casitas Municipal Water District City of Ventura/Ventura Water County of Ventura Friends of the Ventura River Ojai Valley Green Coalition Ojai Valley Green Coalition Ojai Valley Land Conservancy Santa Barbara Channelkeeper Surfrider Foundation Resource Conservation District United States Forest Service Ventura County Watershed Protection District

Ventura Hillsides Conservancy





Lake Casitas intake structure under construction, December 1958. The intake structure is on the reservoir side of the dam, and moves water from the reservoir to the treatment plant. Photo courtesy of Casitas Municipal Water District.

## 2.3.3 **Resiliency through** Infrastructure and Policy Campaign

## 2.3.3.1 **The Issue**

## **Old Infrastructure**

Aging infrastructure—water and sewer pipes, water storage tanks, water wells, flood control channels and levees, debris basins, water treatment systems—is a critical problem challenging water, wastewater, and flood control managers across the state. Old system equipment, often installed 50 to 100 years ago, is reaching the end of its useful life, and managers are encountering new complicating factors surrounding equipment replacement that did not exist when the infrastructure was initially installed.

In the Ventura River watershed for example, a number of key sewer pipelines were originally sited beneath San Antonio Creek when they were installed in the early 1960s. Floods have exposed and damaged these pipelines, but to relocate the pipes today would involve right-of-way issues, changes to slope and associated pumping requirements, and enormous costs related to environmental review, permitting, and mitigation. Some key pipelines remain exposed to flood risk today.

**The Resiliency through Infrastructure and Policy Campaign** seeks to strengthen both infrastructure and local policy in order to reduce the vulnerability of the watershed and its residents to extended droughts, major floods, seismic hazards, and water supply contamination.

The issue of infrastructure repair and upgrading costs is being actively discussed and debated in California, with the realization that the rate schemes put in place long ago did not adequately account for the cost of infrastructure replacement in today's complicated regulatory environment. This is a major issue. Water, wastewater, and flood control agencies are facing enormous repair and retrofit bills.

New infrastructure also means new approaches, and today there is greater understanding of the value of managing water on small-scales as well as large-scales, and making better use of free "ecosystem services." That can mean onsite rainwater harvesting or stormwater treatment, or the use of natural or engineered "green" infrastructure—from bioswales to natural floodplains.

Approaches to water management might also need updating. The need to understand exactly how surface water and groundwater interact has grown as water managers are now tasked with considering the needs of fish and aquatic habitats as well as water customers. More information and better analyses are needed to know more precisely what the needs are of the aquatic habitats, and how and where water management adjustments might be beneficial.

## **Old Policies**

As pipes get outdated, sometimes policies do too. There are opportunities to use local policies to more effectively realize the goals and objectives of the watershed management plan. For example, the ban against single-use plastic bags passed by the City of Ojai in 2012 (and being considered by other local jurisdictions), is helping to reduce trash pollution in local waterways. Similarly, the state of California's easing of regulations regarding "laundry to landscape" graywater systems has made this important water reuse option more available to many residents.

Watershed stakeholders have identified the potential for policies to better address floodplain management, stormwater management, manure management, and other watershed concerns. Besides the need for adopting new or updated policies, significant gains could be realized by streamlining existing regulatory procedures and requirements and, in some cases, by improving the enforcement of existing regulations.

## **A Vulnerable Watershed**

In the Ventura River watershed, dependable infrastructure is especially critical. The watershed is characterized by great variability: cycles of drought and flood are the norm. Infrastructure takes a beating in the major and moderate floods that occur about every 5 years, and cyclic droughts challenge water supply managers to build resiliency and



Golden State Water Company's water main burst under the Ojai Playhouse theater in downtown Ojai in 2014. The flooded theater had to be evacuated. "The cause of the water main break is unknown, other than the age of the pipe," stated a press release from Golden State.

Water supply wells for the City of Ventura, located in the river bottom in the Foster Park area, have seen repeated flood-related damage.



redundancy into their systems. With the water supply 100% local, this prudence is all the more important. The location of the watershed in the Transverse Ranges, one of the most folded, faulted, and rapidly rising regions on Earth, presents earthquake and land movement hazards that must be planned for and considered in emergency response planning.

## **New Threats from Climate Change**

Weather extremes have always been a part of this watershed, and our systems have been designed to anticipate drought, flood, and fire. Even so, current systems may not withstand the extreme events the watershed may face due to climate change: longer extended droughts, megafloods, massive wildland fires, and sea level rise. New system design needs stateof the-art thinking on survivability to contend with uncertain future conditions.

## 2.3.3.2 **Targets**

## Durable, reliable, and efficient water supply system

Water supply equipment and facilities that are up-to-date, strategically located, built for seismic safety, and adaptable to changing hydrologic conditions will increase the safety of the watershed's water supply systems. Complementing centralized infrastructure with smaller-scale, decentralized systems—such as for rainwater harvesting or groundwater recharge—will build important resiliency into the water supply system.

## More water in storage

System improvements that reduce leaks and inefficiencies, and increase water capture, storage or reuse will improve water supply resiliency, whether the water is captured in Lake Casitas, groundwater basins, new storage tanks or in rain barrels. Improvements may be physical, such as more efficient wells or distribution systems—or technology-driven, i.e., sophisticated water metering and electronic sensing and control systems. Improvements may also be achieved through skilled use of management schemes, such as conjunctive water use or conservation pricing.

## Improved safety of people and property from flooding

Reduce flood damage, risk, and vulnerability by improvements to existing flood control channels, levees and other infrastructure, and by restoring floodplains and other lands integral to flood management.

## **Reliably clean water**

Protect water quality by investing in more sophisticated surface water and wastewater treatment equipment. Pursue improvements that capture and treat more urban stormwater runoff before it reaches river/streams; and better protect sewer system mainlines from damaging flood flows.

## **Reduced beach erosion**

The restoration of a more natural sediment transport regime, primarily by removing Matilija Dam, could reduce beach erosion and associated management costs.

## Effective, efficient, enforced local policies and regulations

The goals and objectives of the watershed management plan could be productively supported through current policies that reflect current information and challenges, streamlined permitting processes that encourage rather than discourage beneficial actions (such as removing *Arundo*), and enforcement of existing regulations protective of watershed health.

## 2.3.3.3 Highlights from Existing Projects, Programs, and Practices

Here are a few selected highlights from the watershed's complex and varied infrastructure: from mountain headwaters to dune restoration on Ventura's beaches—a portfolio of reservoirs, levees and habitats, all of which require active management.

## Water Supply



Lake Casitas is a remarkable asset. The reservoir was designed to maintain supplies during a repeat of the 21-year dry period from 1945 to 1965 (the longest drought on record at the time of design), and the lake's managers have established careful policy controls to keep water demand within the 21-year safe yield. In multi-year dry periods, Lake Casitas' reserves are typically more robust than local supply reservoirs found in neighboring watersheds.





The watershed benefits from having established water supply backup systems in place. Most users of groundwater are also connected to Casitas, either for regular or emergency backup. In extended dry periods, the majority of these backup connections are activated, replacing groundwater supplies.

Groundwater basins in the watershed recharge quickly. With basins that are alluvial and largely unconfined, and with plenty of open, unpaved landscapes and drainage channels, recharge of the watershed's groundwater supplies occurs relatively quickly in years of high rainfall. Photo courtesy of Ventura County Watershed Protection District.





Casitas Municipal Water District secured grant funding on behalf of Senior Canyon Mutual Water Company to upgrade old leaking pipes and replace inefficient manually controlled pumping equipment with an efficient automated system. By making better use of local supplies, these improvements reduced the water company's dependence on Lake Casitas.

## **Clean Water**



Ojai Valley Sanitary District replaced and relocated an 800-foot section of underground sewer pipe that ran along the edge of San Antonio Creek. This pipe was vulnerable to damage during floods, which could lead to sewage spills. The district also completed a \$6.5 million Ventura Avenue Sewer Improvement Project (photo above) to update aging infrastructure and reduce energy demand.

Photo courtesy of Ojai Valley Sanitary District.

The City and County of Ventura have installed "full capture" trash excluders on storm drains throughout the watershed. The devices prevent trash from entering the storm drain system and are helping to reduce the amount of trash that reaches the estuary and other parts of the river. Photo courtesy of Ventura County Watershed Protection District.



## Flood

The Ventura County Watershed Protection District developed a watershed hydrology model to better identify locations at risk of flooding and understand how development or other changes in land use could affect water supply or runoff volumes.

The Ventura County Watershed Protection District is pursuing improvements to the watershed's three levees that are required to fully meet current FEMA standards. The district is conducting levee evaluations, design engineering, and CEQA compliance, as well as exploring options for funding the upgrades. Pictured below is the Ventura River Levee, which protects the City of Ventura and lower Highway 33. Photo courtesy of Rick Wilborn.



entura County Flood Hazard / Hot Spots Map Book





Pre-construction elements of the project to remove Matilija Dam and restore the ecosystem are underway, including redesign of Santa Ana Boulevard Bridge (photo above) and Camino Cielo Bridge, sediment studies, and purchase of Matilija Hot Springs.

The City of Ventura, Surfrider Foundation, and California Coastal Conservancy implemented the innovative Surfers' Point Managed Shoreline Retreat Project as an ecosystem-based approach to coastal erosion. The multi-part project was designed to restore the beach profile to natural conditions as an alternative to building a seawall. It included beach/ dune restoration, beach widening, a new multi-use bike path, and new stormwater filtration system and bioswale. The photos above show the area before (2008) and after (2013) the project. Photo copyright ©2002–2013 Kenneth & Gabrielle Adelman, California Coastal Records Project, www.Californiacoastline.org.



The plan at right shows the parking areas removed in order to allow for the "retreat."





Surfers' Point Managed Shoreline Retreat Project

## Policy



## Ojai Valley Clean Air Ordinance

ce 3603 Adopted 7/6/82 • Ordinance 3919 Amended 12/19/89 • Ordinance 3994 Amended 3/3/92 What If My Lot is Located in the City of Ojai?

### What Does the Ordinance Do?

The Clean Air Ordinance limits the number of resi-dential permits that can be issued each calendar year in the unincorporated areas of the Ojai Valley. As stated above, the Clean Air Ordinance only

### Why Was the Ordinance Adopted?

The Federal Clean Air Act requires local jurisdic-tions to attain national health-related air quality standards. The Clean Air Ordinance was adopted standards. The Clean Air Ordinance was adopted by the County to regulate population growth in the Ojai Valley by limiting the increase in the number of dwelling units in order to preserve a reasonable chance of ultimate compliance with those stan-dards and to adequately protect the public health, safety, and welfare.

## What Residential Projects Are Affect-ed by the Ordinance?

The ordinance requires a residential permit be is-sued for all new dwelling units in the Opia Valley (including second dwellings or "granny flas" and mobile homes). The ordinance does not apply to the repair, modification, expansion, or replacement of existing dwelling units.

### What Area is Affected?

The ordinance applies to all new residential units in the unincorporated portion of the Ojai Valley Subarea as defined by the 1994 Air Quality Management Plan (see map in this pamphlet).

To determine the scarc boundaries, you may either refer to the maps posted at the County of Ventura Planning Division Public Information Counter, or you may call the Counter at 805/654-2488. If you call the Public Information Counter it is rec-ommended that you know the Assessor's Parcel Number of your lot.

- As stated above, the Clean Air Ordinance only ap-plics in the unincorporated portions of the Ojai Val-ley. If your property is in the City of Ojai, you must apply through the Ojai Building Department. How Do I Obtain a Residential Per-mit? Apply for a Zoning Clearance at the Planning Division Public Information Counter. You will need to know the Assessor's Parcel Number of
- the proposed lot. une proposed not. • Planning Division personnel will check for existing violations and determine whether the proposed lot is a legal lot of record which can be built upon. If any discretionary permits are required (they are required for second dwellings and caretacker of farm worker dwellings), such permits must be issued before your application may be placed on the Clean Air Ordinance Wait-ing List.
- up Lost. Upon Zoning Clearance approval, a Waiting List Number will be assigned and noted on the per-mit. At present, there is no "waiting" directly associated with the Waiting List the Waiting List Number is used only to track and monitor with work the head near within a de Chen Ait residential development within the Clean Air

## Ordinance boundary. How Much Time Do I Have to Obtain Building Permit?

There are two deadlines to be aware of:

You have 90 calendar days to submit an accept-able application for a Building Permit to the Building Official (for good cause, two 90 day extensions may be granted).

A combination of county and city land use policies (the Guidelines for Orderly Development, Ojai Valley Area Plan, large-lot zoning, growth control policies, SOAR [Save Open space and Agricultural Resources] ordinances), air quality policies (Ojai Valley Clean Air Ordinance), water management policies (Casitas Municipal Water District's Water Efficiency and Allocation Program), and citizen activism have served to keep development within the resource constraints of the watershed.



All local jurisdictions in Ventura County now require new development and redevelopment projects to integrate stormwater retention and treatment into their project design. Bioswales help to capture stormwater and filter pollutants. This bioswale is in the parking lot at Oak Street and Santa Clara Avenue in the City of Ventura. (Oak Street marks the boundary of the Ventura River watershed.)



The Casitas Municipal Water District Board of Directors has established and implements various policies, such as their Water Efficiency and Allocation Program, to help ensure that water supplies are safe and available during extended dry periods.

Lake Casitas is one of the relatively few water supply facilities in California that are operated on a "safe yield" basis. Safe yield is the rate at which the water supply can be "safely" depleted. The designers of the lake determined that "safe" in this case meant that the water in the lake should be managed to last during another 21-year dry period, such as occurred from 1945 to 1965, which was the longest drought on record at the time of the reservoir's design. As long as annual demand on Lake Casitas is less than its 21,630 acre-feet per year safe yield, it should not go dry during a repeat of the 21-year dry period.

In contrast, most water supply facilities in California are operated on an "as available" basis. During wet years, a greater amount of water is delivered to customers than would be allowed under a safe-yield scenario. However, during dry spells, deliveries to customers are reduced, and they must seek other supplies. Delivering water on an "as available" basis allows greater deliveries on the average, but reduces reliability during droughts.

## 2.3.3.4 **Proposed Projects and Programs**

The types of projects and programs below could advance the intent of the Resiliency Through Infrastructure Campaign. Some of these projects are planned and some are already being implemented to some degree. These projects and programs can also be found summarized in table format in "2.4.2 Priority Projects and Programs."

## Establish new/upgrade existing facilities/functions (conventional and natural)

## Water Supply

- Existing Water Supply Infrastructure Reliability Improvements. Replace or retrofit aging or threatened water supply tanks, wells, pipes, and other conveyance and storage equipment to reduce water losses, ensure supply reliability, and bring up to earthquake standards.
- **Contingency Water Storage.** Install decentralized contingency water storage.
- Ventura Water Casitas Conduit Intertie. Install a new 5.5 mile pipeline from Lake Casitas to the City of Ventura, and a pump station, to provide Casitas with a backup for potential water service delivery interruption to the Rincon area and to improve the City of Ventura's water supply reliability and system operational abilities.
- Ventura Water Foster Park Wellfield Restoration. Install additional wells in the Foster Park area to allow the City of Ventura to produce more water from the river when flows are high.
- Ventura Water North-Side Satellite Wastewater Treatment Plant. Install a small (2 million gallons per day) tertiary wastewater treatment plant near the Fairgrounds to treat wastewater from the Westside of Ventura for agricultural and urban reuse.
- **Reclaimed Water Analysis.** Investigate the opportunities for and feasibility of using reclaimed water from the Ojai Valley Sanitary District, such as during winter flows when the water is not so critical in the river.
- Surface Water-Groundwater Interaction Analysis. Increase understanding about the interaction between groundwater extractions and surface flows. Install surface flow monitors at key locations, such as along San Antonio Creek at the Ventura River Basin-Ojai Basin boundary, and within the Ojai Basin. Look for correlations between pumping extractions and changes in surface flow.
- Continuous Groundwater Level and Quality Monitoring Equipment. Install in wells in the watershed's basins instruments that

allow for continuous monitoring of water level and/or water quality parameters.

## Water Quality

- Sewer Trunk Relocation. Relocate a sewer line in the Ventura River threatened by river flow. A sewer line break here would affect water companies, instream uses, and ocean water quality.
- Septic System TMDL Special Study. Conduct a study to identify those septic systems, either individually or by geographic area, that are contributing to the impairment of surface waters in the water-shed. This will facilitate a focused application of available resources to reduce or eliminate the contribution of these systems to water quality impairments.
- Stormwater Retrofit Plan (LID and Green Streets). Develop a plan that inventories, assesses and prioritizes opportunities to retrofit impervious surfaces with alternative approaches (e.g., low impact development [LID] and green streets) that capture, treat, and infiltrate urban stormwater runoff. (Green streets integrate landscapes or other facilities designed to capture, clean, and store stormwater.)
- Stormwater Retrofit Demonstrations (LID and Green Streets). Retrofit impervious surfaces with alternatives (e.g., low impact development and green streets) that capture, treat, and infiltrate urban stormwater runoff in order to demonstrate the use of bioretention systems, permeable surfaces, and runoff treatment and infiltration in urban areas. Prominent public locations will be prioritized when feasible.
- Dry Weather and/or First Flush Diversions. Install devices to capture dry weather and/or first flush contaminated stormwater and send directly to the wastewater treatment plant.
- **Stormwater Parking Lot Retrofits.** Retrofit parking lots to improve stormwater capture and infiltration, where feasible, as they come up for rehabilitation.
- **Trash Excluders.** Retrofit catch basins with trash excluders to filter trash from storm flows.

## Matilija Dam

- Matilija Dam Removal Studies and Mitigation. Studies will take another look at dam removal and sediment transport options. Various improvements are required to mitigate for the dam's removal.
- Matilija Dam Removal. Remove dam to restore sediment transport and access for migrating steelhead, and eliminate the dam failure hazard.

## Flooding

- Bring Levees up to FEMA Standards. Complete levee improvements required to meet FEMA certification requirements.
- Channel, Stormdrain, and Culvert Improvements. Make various improvements to address channel erosion and flooding problems.
- Debris Basin Installation/Maintenance Fresno Canyon Flood Mitigation. Construct a reinforced concrete pipe diversion from upstream of Highway 33 to Ventura River. The purpose of this project is to protect the community of Casitas Springs from a 100-year (or 1% annual exceedance probability) flood in Fresno Canyon.
- Flood Modeling Thacher Creek Flood Mitigation. Use modeling to plan improvements to Thacher Creek, which is undersized and carries a heavy sediment load.

## Natural/Other

- **Riparian Habitat and Wetland Restoration.** Restore riparian habitats and wetlands to promote attenuation of flood flows, capture of sediments, treatment of runoff, infiltration and to deter algae growth.
- Increase the emergency preparedness of service providers.
- Extended Drought/Climate Change Preparation. Facilitate ambitious, coordinated planning, preparedness, and response for extended droughts.
- Megastorm (ARkStorm) Scenario Drill. Develop response plans for a megastorm hitting the watershed and test the plans with a fullscale real-time exercise. Work with emergency services, water and sanitary districts, the media, and local and state government.

## Monitor policy changes and implementation, and promote policy updates that advance the watershed's resiliency

- **Single-Use Bag Ban.** Promote adoption of a single-use bag ban by the County of Ventura and City of Ventura (already adopted by City of Ojai).
- Efficient Conservation Subdivision Permit Process. Work with the Ventura County Planning Division to help make the conservation subdivision process as efficient and inexpensive as possible. A conservation subdivisions is a special exemption from Ventura County zoning and subdivision regulations for the purposes of donating or selling land to a conservation organization.
- Mixed Use Zoning. Amend Ventura County's and the City of Ojai's zoning ordinances to allow appropriate mixed use zoning in urban

communities in order to advance our watershed goals, such as minimizing impervious cover and open space loss.

• North Ventura Avenue Area Plan. Update Ventura County's North Ventura Avenue Area Plan (integrate appropriate mixed use, LID, Parkway access, mobility, etc.).

## **Work Together**

- Coordinated Water Quality Monitoring. Investigate opportunities to coordinate the various water quality monitoring programs to reduce redundancy, and improve the cost-effectiveness and utility of the data, such as by sharing monitoring locations, standardizing protocols and formats, and sharing data.
- Integrated and Accessible Water Quality Monitoring Data. Maximize the usefulness of the water quality monitoring data collected by different organizations by compiling and interpreting the data, and offering user-friendly access to it.
- Flood Control Project Design. Participate in the Watershed Protection District's pre-design stakeholder process for flood control projects.

## 2.3.3.5 Organizations

The following organizations and entities are actively supportive of the intent of the Resiliency Through Infrastructure and Policy Campaign.

California Coastal Conservancy Casitas Municipal Water District City of Ojai City of Ventura/Ventura Water Meiners Oaks Water District Ojai Basin Groundwater Management Agency Ojai Valley Green Coalition Ojai Valley Land Conservancy Ojai Valley Sanitary District **Resource Conservation District** Surfrider Foundation Ventura County Environmental Health Division Ventura County Planning Division Ventura County Public Works Department Ventura County Watershed Protection District Ventura Hillsides Conservancy

Ventura River Water District



**The Extreme Efficiency Campaign** seeks to maximize the conservation of water by all water users by continually realizing greater water use efficiency from equipment, technology, and people; pursuing more opportunities to reuse water; and rewarding conservation.

## 2.3.4 Extreme Efficiency Campaign

## 2.3.4.1 The Issue

Cyclical dry periods are a permanent part of the landscape here, so water users in the Ventura River watershed have pursued water conservation and use efficiency for decades. New technologies do appear, however, and existing systems age out and require replacement, so the potential for greater conservation and efficiency remains significant. Water users can do more to conserve, and water suppliers can help them. Some efficiency improvements employ new high efficiency technology that can offer easy water savings. Other changes may take a bit more effort, such as changing landscapes or behavior.

Water users continue to pursue water use efficiency because the benefits of conservation are real and immediate: Reduced demand can help keep water bills low and conserves groundwater supplies. Higher groundwater levels could supply more water to local streams, supporting healthy aquatic habitats and swimming holes. In multi-year dry periods, conserved water helps extend precious lake supplies.

### Targets 2.3.4.2

## State-of-the-art water use efficiency by all sectors, indoors and outdoors

Make our water using fixtures, equipment, and practices more efficient with more advanced systems together with better education and incentives that effectively change behavior.

## Increased water reuse

Expand and encourage large-scale and small-scale water reuse. Reused water reduces not only water demand but also energy demand. Every gallon of water that doesn't need to be further treated or pumped saves energy.

## **Highlights from Existing Projects,** 2.3.4.3 **Programs, and Practices**

## Here are a few selected highlights from the watershed's ongoing commercial and residential water use efficiency projects, programs, and practices.

The Casitas Municipal Water District offers a variety of water conservation and water use efficiency programs, which are available to all water uses within Casitas's wholesale service area (whether a customer of Casitas's or not). Their programs include free water saving showerheads, toilet flappers, and faucet aerators; residential and commercial water use surveys and leak detection; hobby farm irrigation evaluations (and equipment rebates); and rebates on residential and commercial high-efficiency toilets, washing machines, and weather-based irrigation controllers. Casitas hosts free educational classes on various ways to save water, such as landscaping with natives or installing a graywater system. Classroom and field trip water education is also provided. Photo courtesy of Casitas Municipal Water District.





Ventura Water (City of Ventura) offers their customers rebates on rain barrels, promotes Ocean-Friendly Gardens, provides school water education, and hosts classes and events.

## RAIN BARREL DISCOUNT VOUCHER



## For City of Ventura Residents

Ventura Water and the City of Ventura Environmental Sustainability Division in cooperation with Smith Pipe & Supply are please to offer the Channel/Bushman 60-gallon rain barrel at a discounted price of \$42.00 plus tax (\$85 retail value) to City of Ventura residents only.

Present this voucher at Smith Pipe & Supply, 3060 Sherwin Avenue, Ventura, CA to receive the discount on up to two rain barrels per residential address. Bring proof of City of Ventura residency such as a Ventura Water or other utility bill. These rain barrels are for non-potable water use only. Subject to availability.









Spring Spruce-up with Ventura Water and SustainableVentura.T



The City of Ventura produces educational videos on a variety of water saving topics (above), such as how to use rain barrels or how to check your water meter for leaks. They make active use of their website and social media (right) for outreach and education.

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The Ojai Valley Green Coalition (OVGC) is an important voice for water conservation in the watershed. OVGC seeks out many opportunities to educate the public, including classes and member meetings, an annual Green Living Home Tour, displays at public venues, newsletter promotions, and distribution of free water saving equipment on behalf of Casitas Municipal Water District. The OVGC has an extensive lending library with books, videos, and literature at its downtown Resource Center. The group is active in advancing policies to protect local resources.







The Ventura River Watershed Council's <u>SAVE MORE WATER</u> website, hosted on the main Watershed Council site, serves as a clearinghouse of information on saving water throughout the watershed. The site features many videos, lists of upcoming classes and events, and links to water saving resources provided by local water suppliers and organizations—free equipment, rebates, free on-site irrigation surveys, and more. SAVE MORE WATER is aimed at motivating and informing residential, commercial, and agricultural water users to conserve.

The Ventura County Building and Safety Division has been actively promoting graywater systems since the state of California's easing of regulations regarding "laundry to landscape" graywater systems has made this important water reuse option more available to many residents.

## 2.3.4.4 Planned Projects and Programs

The Extreme Efficiency Campaign proposes solutions aimed at equipment and technology improvements, together with improved and ongoing education aimed at motivating behavioral changes, and includes all sectors—residential, commercial, and institutional. The projects and programs below could advance the intent of the Extreme Efficiency Campaign. Some of these projects are planned and some are already being implemented to some degree. These projects and programs can also be found summarized in table format in "2.4.2 Priority Projects and Programs."

## Promote and Incentivize the Use of High Efficiency Fixtures and Equipment, and Graywater Systems

- Water Use Efficiency and Reuse Education Program. Promote and incentivize water use efficiency and reuse (e.g., low-water-using landscapes; replacement of hobby orchards with lower-water-using landscapes; use of local, woody mulch; use of graywater systems; high-efficiency plumbing retrofits, fixing leaks, efficient use of agricultural water). Install demonstration landscapes.
- Landscape Irrigation Efficiency Audits/Upgrades. Continue to promote the availability of Casitas Municipal Water District's free landscape irrigation efficiency surveys; continue or expand subsidies for equipment upgrades.
- Native and Climate-Appropriate Plant Education. Develop and implement an education program that promotes landscaping with natives and other climate-appropriate plants.
- Agricultural and Hobby Orchard Irrigation Efficiency Evaluations. Continue to promote the availability of the Resource Conservation District's free irrigation efficiency evaluation program (Mobile Irrigation Lab) for farms and hobby orchards; continue or expand subsidies for equipment upgrades.

## **Consider Rate Incentives**

• Water Rate Analysis. Research creative water rate model options that strongly incentivize conservation while covering district costs. Analyze the relative amount of funding spent by local water suppliers on conservation.

## **Use Policies**

• Plumbing Fixture Retrofit Policy Enforcement. Monitor enforcement of the Ojai Area Plan policy that stipulates that new development must not add any net increase demand to existing water supplies. This is achievable through mitigation such as off-site plumbing retrofits.

## **Work Together**

Facilitate communication and collaboration among those working to advance water conservation and water use efficiency. Look for opportunities to support one another's work, learn from each other, leverage resources and craft a smarter, more integrated approach to the task.

## 2.3.4.5 Organizations

The following organizations and entities are actively supportive of the intent of the Extreme Efficiency Campaign.

Casitas Municipal Water District City of Ventura/Ventura Water Meiners Oaks Water District Ojai Basin Groundwater Management Agency Ojai Valley Green Coalition Resource Conservation District Surfrider Foundation Ventura River Water District



**The Watershed-Smart Landscapes and Farms Campaign** seeks to improve and innovate residential and commercial landscape and farm management practices in order to protect, supplement, and extend water supplies, and protect the long-term viability of farms.

## 2.3.5 Watershed-Smart Landscapes and Farms Campaign

## 2.3.5.1 **The Issue**

Irrigated agriculture is a major land use in the watershed, and local farms are an important and valued part of the economic and cultural history of the watershed. In 1956, Congress authorized the construction of Lake Casitas. The bill's language emphasized that the new water supply was needed for agricultural and economic opportunities. Today, agricultural water accounts for about 45% of the water use from Lake Casitas, and growers are a major user of groundwater in the watershed.

Agriculture plays a critical role in maintaining many services supportive of a healthy watershed. The citrus and avocado orchards that embody the rural character of the watershed also provide expanses of unpaved land that infiltrates rainwater and slows flood flows; serve as wildlife corridors and habitat; and provide attractive views and local food. Should these orchards become unviable, the character of the watershed would change dramatically.

Landscapes, especially in the Ojai Valley, are also a significant land use. The watershed is home to several golf courses, many public and private schools with ball fields, and large residential properties and estates. Residential landscapes throughout the Ojai Valley are planted with small citrus orchards, which are irrigated, but may never be harvested. Landscape water generally accounts for at least half of residential water demand, but can run much higher when landscapes are on the large side, like in the Ojai Valley.

Efficient irrigation is already widely practiced in the watershed, but there is still considerable room for reducing the water demand of landscapes and farms. Agricultural and landscape irrigation together can account for as much as two-thirds of local water use. With such a large volume of water involved, many small improvements in efficiency can result in significant savings—extending limited water supplies and reducing water costs for irrigators.

Landscapes and farms also serve the important function of infiltrating rainwater for groundwater recharge. Better land contouring, use of mulch, and other practices could capture and infiltrate much more of the watershed's rainfall and stormwater runoff.

Fertilizers used by landscapes and farms are one of the sources of nutrients that can cause water quality impairments in the watershed. Reducing this load of nutrients on water supplies may be required to improve water quality and meet regulatory requirements.

## 2.3.5.2 **Targets**

## Reduced demand for landscape and farm irrigation water

With improved irrigation efficiency and less-water-demanding landscapes, the amount of water used for irrigation in the watershed could be significantly reduced.

## Increased groundwater recharge

Through better land contouring and diversion of stormwater to landscaped swales, landscapes and farms could capture and infiltrate more of the watershed's rainfall and stormwater runoff, thereby improving recharge of groundwater basins.

## Cleaner groundwater and surface water

With better management of fertilizers and livestock waste, nutrient concentrations in groundwater and surface water could be reduced.

## A viable agricultural industry

Reducing water costs through improved efficiency, helping growers meet regulatory requirements, and studying options in the face of pest threats would help keep local farms viable.

## 2.3.5.3 **Highlights from Existing Projects, Programs, and Practices**

Irrigation efficiency in agriculture and landscape has been pursued in the Ventura River watershed ever since the first local farmers faced down a 21-year dry period between 1945 and 1965. Water conservation is a constant priority. Growers and landscape managers keep abreast of the latest



Mulch is widely used in watershed orchards to save water, but it has other benefits as well. The mulch cover holds moisture in the soil, reduces soil temperature, and suppresses weeds. Mulch cover slows and absorbs rainfall and applied irrigation water, improving infiltration and preventing erosive runoff. By preventing fertilizers and other nutrients from traveling off-site in runoff, mulch cover is a recommended BMP for protecting water quality.

It is very important to use locally sourced mulch in order to prevent the spread of exotic pests from mulch imported from outside the area. Ojai Valley Organics can supply locally-sourced mulch in the Ojai Valley. Row crop growers in the watershed use drip tape to produce food with the minimum water necessary. Narrowly focusing irrigation reduces weed growth as well.





Ocean Friendly Gardens (OFG) is a national Surfrider Foundation program for transforming landscapes and hardscapes to prevent water pollution. Landscapes that use rainwater as a resource and employ conservation, permeability, and retention practices are promoted. The Ventura County Surfrider chapter, the City of Ventura, the Ojai Valley Green Coalition, and others have partnered to advance OFG in the watershed through training workshops, landscape retrofits, demonstration projects, and educational videos.



The Ojai Community Demonstration Garden, located next to Ojai City Hall, provides a forum for educating residents about landscape management techniques which conserve water and reduce waste. Water conservation is demonstrated through the use of drought-tolerant plantings appropriate to Ojai's microclimate, mulching, and drip irrigation systems. Workshops are offered at the garden, such as the one pictured above on how to landscape with native plants. Photo courtesy of Les Dublin.

Throughout the year, Casitas Municipal Water District (CMWD) hosts water use efficiency and conservation workshops. In this photo, Dr. Ben Faber of the University of California Cooperative Extension lectures growers on irrigation efficiency. Photo courtesy of CMWD.



controllers.

Photo courtesy of CMWD.

Casitas Municipal Water District (CMWD) offers free onsite landscape surveys throughout their wholesale service area. The surveys include a review of the irrigation system, irrigation design, and watering schedules. CMWD also offers rebates on selected residential and commercial weather-based irrigation



Graywater workshops have been provided by the Ventura County Building and Safety Division, Casitas Municipal Water District, and Ojai Valley Green Coalition (OVGC). This photo is of an OVGC hands-on workshop. Photo courtesy of OVGC.



Through their "Mobile Irrigation Lab," the Ventura County Resource Conservation District (RCD) provides free on-site agricultural irrigation system analysis and technical assistance to improve water use efficiency. Included is a cost share program to help fund "best management practice" (BMP) implementation for irrigation systems of orchard, row crop, and nursery operations. Photos at right courtesy of the RCD.







Ventura County Agricultural Irrigation Lands Group (VCAILG), administered by Farm Bureau of Ventura County, offers a number of educational workshops for growers each year. The classes focus on various aspects of water quality, and attendance by VCAILG participating growers helps meet water quality regulations.

Photo courtesy of UC Cooperative Extension.

## HORSE AND LIVESTOCK WATERSHED ALLIANCE

The recently formed Horse and Livestock Watershed Alliance represents horse and livestock owners in the Ojai Valley. The group works with horse and livestock owners to improve manure management practices that affect water quality, and works with water quality regulators to help craft fair regulatory schemes that minimize economic impacts. techniques and equipment to get the most out of the limited supply of local water. Managing fertilizers and animal wastes is also an important part of being watershed-smart, and educational programs are in place to help make further improvements to these management practices. Below are selected highlights from the watershed's existing landscape and farm projects, programs and practices.

## 2.3.5.4 Proposed Projects and Programs

The Watershed-Smart Landscapes and Farms Campaign proposes a wide range of solutions to this issue, from small-scale backyard improvements to large-scale institutional retrofits. Improvements can be made at residences, businesses, and farms. The projects and programs listed below—some in the planning stage and others already underway—could advance the intent of the Watershed-Smart Landscapes and Farms Campaign. These projects and programs can also be found summarized in table format in "2.4.2 Priority Projects and Programs."

## **Increase Landscape and Farm Irrigation Efficiency**

- Landscape Irrigation Efficiency Audits/Upgrades. Continue to promote the availability of Casitas Municipal Water District's free landscape irrigation efficiency surveys; continue or expand subsidies for equipment upgrades.
- Agricultural and Hobby Orchard Irrigation Efficiency Evaluations. Continue to promote the availability of the Resource Conservation District's free irrigation efficiency evaluation program (Mobile Irrigation Lab) for farms and hobby orchards; continue or expand subsidies for equipment upgrades.

## Decrease Water Demand through Better Plant Selection, Landscape/Farm Design and Maintenance, and Water Reuse

- Landscape Water Use Efficiency and Reuse Education Program. Promote and incentivize replacement of turf and hobby orchards with lower-water-using landscapes; use of local, woody mulch; and use of graywater and rain barrel/cistern water for irrigation. Install demonstration landscapes.
- Ocean/River-Friendly Gardens Education Program. Expand the Ocean/River-Friendly Gardens program (which promotes conservation, rain harvesting, and non-polluting methods) watershed-wide; integrate incentives.

- Native and Climate Appropriate Plant Education. Educate and motivate people about landscaping with natives and other climate-appropriate plants.
- Water Efficient Crop Study. Research the feasibility of alternative crops in the watershed that are economically sustainable and low-water using. This could serve as an Asian Citrus Psyllid contingency plan.
- Stormwater Parking Lot Retrofits. Retrofit parking lots and their landscapes to improve stormwater capture and infiltration, where feasible (given clay soils and high groundwater) as they come up for rehabilitation.

## Improve Water Capture and Infiltration

- Slow It/Spread It/Sink It Campaign. Coordinate an educational program to advance onsite rain/stormwater harvesting at residences, churches, schools and businesses; integrate incentives, demonstration projects, and showcase individual examples.
- **On-Farm Water Detention/Retention Analysis.** Investigate opportunities for small-scale on-farm stormwater detention and storage options (e.g., swales, contours, wet ponds, rainwater harvesting, underground storage).

## Improve Nutrient Management

- Farm and Stable Nutrient Management Program. Promote farm and/or stable nutrient management best management practices (BMP) (e.g., filter strips, rainwater collection, manure management, erosion control, off-stream watering); offer on-farm/stable evaluations, BMP design, and technical assistance; identify priority parcels for livestock BMP implementation. Include Spanish-language component and demonstration projects. Showcase individual examples.
- Water Pollution Prevention Campaign. Develop and implement an educational program to prevent water pollution from fertilizers and other nutrients, pesticides, and herbicides.
- Livestock Nutrient Management Program. Promote livestock nutrient best management practices (BMP) (e.g., rotational grazing, off-stream water facilities, salt/supplement feeders, the installation of stream/river exclusionary fencing where appropriate, and erosion control); offer water quality assessments, BMP design, and technical assistance.

## **Work Together**

Facilitate communication and collaboration among those already working on efforts that help make landscapes and farms more watershed-smart. Look for opportunities to support one another's work, learn from each other, leverage resources and craft a smarter, more integrated approach to the task.

## 2.3.5.5 Organizations

The following organizations and entities are actively supportive of the intent of the Watershed-Smart Landscapes and Farms Campaign.

Casitas Municipal Water District City of Ojai City of Ventura/Ventura Water Farm Bureau of Ventura County Meiners Oaks Water District Ojai Basin Groundwater Management Agency Ojai Valley Green Coalition Resource Conservation District Santa Barbara Channelkeeper Surfrider Foundation UC Cooperative Extension Ventura County Coalition of Labor, Agriculture and Business Ventura County Watershed Protection District

Ventura River Water District



## 2.3.6 Arundo-Free Watershed Campaign

**The Arundo-Free Watershed Campaign** seeks to remove, and keep at bay, the invasive non-native plant Arundo donax, which consumes excessive amounts of water, poses a major fire hazard, clogs flood control channels, and destroys native habitat.

## 2.3.6.1 **The Issue**

Every day during the watershed's warm season, a single acre of the invasive, non-native plant *Arundo donax* can take 39,000 gallons of precious stream and ground water—up to three times as much water as the native streamside plants that it outcompetes. Each acre infested removes 4.8 million gallons of water, or 3.2 million gallons of water more than native streamside plants, every year. That's an annual water supply for 16 households or four acres of citrus. It is estimated that there are over 180 acres infested with Arundo in the watershed.

*Arundo donax*, or giant reed, is a bamboo-like plant that is among the fastest growing terrestrial plants—growing up to four inches a day during the warm months, and reaching heights of up to 30 feet.
Just like Bermuda grass, *Arundo* grows by sending out underground vegetative shoots, or rhizomes, that take root and send up new stalks. It spreads when pieces of rhizome fragments break off, travel downstream and take root in moist soil. *Arundo* forms massive thickets of vegetation that can cover many acres, virtually eliminating all other plant species, along with the critical wildlife habitat of streamside ecosystems.

Besides consuming so much water and crowding out native habitat, *Arundo* also poses a severe fire risk: the plant contains volatile oils that make it highly flammable; and infestations along streams can act like wicks, quickly spreading fires to new areas. During floods *Arundo* can also create hazards when uprooted plants clog flood control infrastructure.

Hundreds of acres of *Arundo* have already been removed in the watershed. By completing the job of removing remaining major infestations, the watershed can realize the water savings, and the many other benefits of having the plant gone. The need for ongoing monitoring and retreatment will always remain, but relative to the cost of other water supply projects, *Arundo* control is considered a bargain.

## 2.3.6.2 **Targets**

### Increased groundwater supplies and summertime streamflow

Less *Arundo* means less water consumed along streams, leaving more water in streams and groundwater basins.

### Improved habitat

As soon as *Arundo* is removed, native plants and animals begin returning and the watershed's abundant natural biodiversity begins to reestablish itself.

## 2.3.6.3 Highlights from Existing Projects, Programs, and Practices

Thanks to extraordinary and persistent efforts by agencies, private property owners, and hundreds of volunteers organized by local nonprofit organizations, *Arundo* control in the watershed has made great progress—especially in the last 10 years. About 270 acres of Arundo have been removed, and much of this acreage is being monitored for regrowth. Once established, *Arundo* can be persistent, but by removing the big stands and controlling regrowth, the massive stands that choke out habitat and consume so much water can be prevented. Here are a few selected highlights from the watershed's ongoing *Arundo donax* removal projects, programs, and practices.



The Ventura County Watershed Protection District (VCWPD) has played a lead role in *Arundo* control efforts—starting with a demonstration project in 2004. The project was designed by the Ventura County Arundo Task Force to evaluate the cost-effectiveness of four different methods of eradication and to improve public support for future *Arundo* removal. The VCWPD administered the demonstration project on a five-acre section on the east bank of the Ventura River near Casitas Springs. Severe flood flows in 2005 scoured much of project area and interfered with the trials, but valuable information was gained nonetheless.



Since the first 2004 project, the VCWPD has launched several ongoing *Arundo* removal projects on the lower Ventura River, upper San Antonio Creek and its tributaries, and other VCWPD land holdings. Photo courtesy of VCWPD.



The watershed's largest VCWPD *Arundo* removal project started in 2008 on Matilija Creek and the upper Ventura River. 200 acres of Arundo in a 1,200-acre area were removed. The map shows the areas of *Arundo* (giant reed) infestation above and below Matilija Dam prior to removal.





The project to remove *Arundo* above and below Matilija Dam was part of mitigation associated with the project to remove Matilija Dam and restore the ecosystem. Ongoing monitoring and retreatment continues on VCWPD's projects. Photos show the Arundo infestation above Matilija Reservoir, before, during removal, and after. Photos courtesy of VCWPD.



Private property owners are actively helping to control *Arundo*. The owners of Taylor Ranch in the lower watershed removed over 45 acres of *Arundo* in the riverbed of the lower river area.







On the Taylor Ranch on the lower Ventura River, *Arundo* had grown into monoculture stands that had choked out most other vegetation and provided makeshift illegal camp shelters. With the *Arundo* removed, native vegetation is returning, and the property owners continue to monitor and retreat the area as needed.





The Ojai Valley Land Conservancy has facilitated some large *Arundo* removal projects on its properties, and continues to monitor and control. These photos show removal and revegetation on the Ventura River Preserve in 2006.





Ventura Hillsides Conservancy is removing Arundo on their properties, using hand tools and lots of volunteer hours.



Restoring Riparian Habitats in Ventura County & along the Santa Clara River in Los Angeles County

The Ventura County Watershed Protection District and the Ventura County Planning Division produced a *Guide to Native and Invasive Streamside Plants* booklet to help educate residents about the problems that invasive plants, including *Arundo*, pose to streamside habitats.

## 2.3.6.4 **Proposed Projects and Programs**

The types of projects and programs below could advance the intent of the Arundo-Free Watershed Campaign. Some of these projects are planned and some are already being implemented to some degree. These projects and programs can also be found summarized in table format in "2.4.2 Priority Projects and Programs."

### **Remove and Continue to Control Arundo**

Continue to remove *Arundo* infestations and monitor and retreat regrowth as necessary. Key infestations targeted for removal include areas along San Antonio Creek and the Ventura River floodplain from the Highway 150 Bridge south.

### **Reduce Permitting Time and Costs**

Pursue strategies to reduce the cost and burden of securing permits for *Arundo* removal. Clustering projects into one permit may be one strategy.

# Engage the Community and Encourage Stewardship

Develop an education and outreach program that explains the problems that *Arundo* presents in the watershed and encourages property owners and land managers to proactively prevent its spread.

### Work Together

Facilitate communication and collaboration among those already working on efforts to remove and monitor *Arundo*. Look for opportunities to support one another's work, learn from each other, leverage resources and craft a smarter, more integrated approach to the task.

## 2.3.6.5 **Organizations**

The following organizations and entities are actively supportive of the intent of the *Arundo*-Free Watershed Campaign.

Aera Energy

California Coastal Conservancy

City of Ventura

Ojai Valley Land Conservancy

Taylor Ranch

Ventura County Parks Department

Ventura County Resource Conservation District

Ventura County Watershed Protection District

Ventura County Weed Management Area

Ventura Hillsides Conservancy



## 2.3.7 Healthy San Antonio Creek Campaign

## 2.3.7.1 **The Issue**

San Antonio Creek subwatershed is a key drainage in the Ventura River watershed. One of the two principle drainages in the watershed, it carries 34% of the watershed's median annual runoff.

The Ojai Valley Groundwater Basin drains into San Antonio Creek. For much of the year, flow in the lower half of San Antonio Creek is groundwater from the basin. Demands on or impacts to the groundwater basin directly affect the creek. The San Antonio Creek subwatershed drains the largest urban area in the Ventura River watershed—the City of Ojai and surrounding unincorporated areas. The population density adjacent to much of the creek is the highest of any tributary in the watershed. San Antonio Creek also drains the most intensively farmed area in the watershed—the Ojai Valley's East End.

Contaminants that make their way from urban and agricultural areas to San Antonio Creek not only pollute the creek and its aquatic habitats, but also the water in the Ventura River all the way down to the sensitive fisheries in the Ventura River estuary at the coast. Nutrient pollution, which can contribute to algae blooms, is a significant contaminant that local agencies must address. The highest in-stream nutrient concentrations in the watershed are found in San Antonio Creek.

Rhizome fragments from infestations of the invasive, water-thirsty plant *Arundo donax* travel downstream from San Antonio Creek, creating a constant source of new *Arundo* infestations all the way down the Ventura River.

**The Healthy San Antonio Creek Campaign** seeks to increase the flow of clean water in San Antonio Creek, increase recharge of the interconnected Ojai Valley Groundwater Basin, and improve the creek's riparian and instream habitats.

> San Antonio Creek also offers some of the watershed's most important spawning and rearing habitat accessible to the endangered southern California steelhead. Migratory steelhead using San Antonio Creek benefit from more reliable flow, and avoid the "dry reach"—the wide, alluvial section of the Ventura River upstream of the San Antonio Creek confluence that is dry most of the year. The creek generally flows longer than other accessible streams and contains gravel needed by steelhead for spawning. Steelhead have been found to grow faster in the San Antonio Creek than elsewhere in the watershed.

## 2.3.7.2 **Targets**

#### Increased groundwater recharge and summertime streamflow

With improved water conservation, and water capture and infiltration, groundwater levels in the Ojai Valley Groundwater Basin could remain higher for longer, thus improving the amount of summertime streamflow (relative to rainfall) in San Antonio Creek. Additionally, removal of the invasive, non-native plant *Arundo donax* would significantly reduce the amount of water used by streamside plants.

### Cleaner groundwater and surface water

With better management of fertilizers, septic systems, and horse and livestock wastes, nutrient concentrations in groundwater and surface water could be reduced.

#### Thriving steelhead

With structural in-stream improvements, such as the addition of more over-summering pools, together with increased summertime streamflow, steelhead recovery could be dramatically enhanced.

## 2.3.7.3 Highlights from Existing Projects, Programs, and Practices

Many of the existing projects, programs, and practices described in the other campaigns are also relevant to the Healthy San Antonio Creek Campaign. In addition, here are some highlights specific to the San Antonio Creek subwatershed.



The Ojai Basin Groundwater Management Agency (OBGMA) is a special-act district that manages the water of the Ojai Valley Groundwater Basin. Formed by state legislation in 1991, OBGMA is one of only 13 such districts with groundwater management authority in California. The agency was established in the fifth year of a drought, amidst concerns of local water agencies, water users, and well owners about potential groundwater basin overdraft. The OBGMA is administered collaboratively by key stakeholders: the 5-seat board includes the City of Ojai, Casitas Municipal Water District, Golden State Water Company, Ojai Water Conservation District, and one mutual water company representative.

The OBGMA monitors groundwater levels through key monitoring wells (graph, right) and develops models to better understand and manage the basin.





The Ojai Valley Groundwater Basin underlies the City of Ojai and Ojai Valley's East End, where the majority of the watershed's agriculture is located.







Spreading Grounds project was designed to divert surface water from upper San Antonio Creek for recharge of the Ojai Valley Groundwater Basin using passive injection wells. Annual recharge is estimated to average 126 acre-feet of water with a maximum of 914 acre-feet per year. The project was a collaboration between the OBGMA and the Ventura County Watershed Protection District, with state grant funding secured through the Watersheds Coalition of Ventura County. Casitas Municipal Water District is also a project partner helping with facility maintenance. Top photo: spreading grounds intake structure; bottom photo: holding basins. Photos courtesy of Ventura County Watershed Protection District.



Ideal steelhead spawning habitat has cool, oxygen-rich water with clean gravel along the channel bottom and in-stream vegetative cover. Steelhead spawning surveys show that the lower reaches of the San Antonio Creek have these habitat characteristics and that fish are spawning there. There is a potential to expand these habitats and improve the quality of existing habitats with the addition of more rearing habitats, such as deep pools, removal of invasive plants, and revegetation of bare stream banks. Pictured at right is ideal steelhead habitat on lower San Antonio Creek.



A 20-inch adult steelhead in San Antonio Creek, about a half-mile above its confluence with the Ventura River, April 2012. Photos courtesy of Scott Lewis.



The Ojai Valley Green Coalition and the C.R.E.W. (Concerned Resource and Environmental Workers), along with lots of volunteers, have teamed up to restore the West Barranca, located behind Libbey Park in downtown Ojai. The barranca is a tributary of Ojai Creek, which eventually drains into San Antonio Creek. Team members have removed the invasive plant thickets that had smothered the creek and installed native plants.



The Ojai Valley Land Conservancy collaborated with the California Conservation Corps and The C.R.E.W. to remove over 200 Mexican fan palms from Fox Canyon Barranca and Stewart Canyon Creek. This project continues the work begun on Ojai Creek in Libbey Park.



The Ventura County Parks Department installed 44 native trees along the San Antonio Creek riparian corridor in Camp Comfort; 102 native trees along Thacher Creek, which runs through Soule Park golf course and day use park; and 72 native trees in the riparian corridor of Foster Park.

Between 2009 to 2011, the Ventura County Watershed Protection District (VCWPD) removed approximately six acres of *Arundo* (within a 212-acre area) from upper San Antonio Creek and its tributaries: McNell, Thacher and Reeves Creeks. Grant funding for this project was secured through the Watersheds Coalition of Ventura County. Photo courtesy of VCWPD.





The Farm Bureau of Ventura County administers VCAILG (Ventura County Agricultural Irrigated Lands Group) on behalf of farmers in Ventura County. The program is a "Conditional Waiver" program, an approach to complying with required water quality regulations collectively rather than individually. Landowners and growers are asked to provide VCAILG with information on their management practices, participate in educational workshops, and implement best management practices to reduce or eliminate contaminated discharges.

Photo courtesy of University of California Cooperative Extension-Ventura.

VCAILG performs water quality monitoring and reporting. The photo at right is an excerpt from a VCAILG report that describes one of their two monitoring sites in the watershed.

#### VRT\_SANTO

This monitoring site is located on San Antonio Creek just upstream of Grand Avenue in Ojai. San Antonio Creek is a tributary of the Ventura River.



This site remained dry during the 2012 monitoring events. Table 47 includes the number and types of trash observed at the monitoring site. Citrus and avocados are the predominant crop types associated with this site.

Several impediments to fish passage in the San Antonio Creek watershed have been removed in recent years through the construction of bridges. The bridges allow the natural channel bottom to reestablish and remove low flow impediments to fish migration.



In 2010, this bridge replaced a "fair weather crossing" (a road crossing that allows a waterway to run over a road) on Lion Canyon Creek, a major tributary of San Antonio Creek. The bridge improved steelhead access to over nine miles of upstream habitat. Photos courtesy of South Coast Habitat Restoration.



A beautiful bridge for pedestrians and bicyclists using the Ojai Valley Bike Trail was installed in 2012 at the very end of San Antonio Creek, just before it merges with the Ventura River. The bridge replaced an old concrete crossing over some box culverts that frequently became plugged with woody debris during storms.

Photos courtesy of Ventura County Star (left) and Santa Barbara Channelkeeper (right).



A fair weather crossing in lower San Antonio Creek at Old Creek Road was replaced with a multi-span bridge in 2012. Photo (right) courtesy of Ventura County Public Works Transportation Department.



A clear span bridge was constructed in 2013 on San Antonio Creek near the confluence with Stewart Canyon Creek, just south of the City of Ojai. The bridge replaced a fair weather crossing on private property. Photo courtesy of Bill O'Brien.

## 2.3.7.4 Proposed Projects and Programs

The Healthy San Antonio Creek Campaign focuses all the work described in the Council's other campaigns in a targeted subwatershed because efforts focused on San Antonio Creek can yield great benefits throughout the watershed. This campaign is an integrated campaign that works on many fronts. The projects and programs listed below—some in the planning stage and others already underway—could advance the intent of this campaign. These projects and programs can also be found summarized in table format in "2.4.2 Priority Projects and Programs."

### Target Implementation of Projects and Programs from the Council's Other Campaigns in the San Antonio Subwatershed

The San Antonio Creek campaign takes a holistic and comprehensive approach, drawing ideas from project and program solutions described for the Council's entire slate of campaigns.

- Watershed-Smart Landscapes and Farms Campaign
- Extreme Efficiency Campaign
- Resiliency Through Infrastructure and Policy Campaign
- Arundo-Free Watershed Campaign
- River Connections Campaign

### **Protect the Groundwater Basin**

• Land Subsidence Monitoring. Establish a land subsidence monitoring network using real time kinematic GPS to measure changes in ground elevation due to groundwater pumping-related subsidence.

### **Restore and Protect Habitats**

- Steelhead Restoration Plan. Consolidate existing watershed-specific steelhead data (e.g., habitat, population and monitoring data). Identify priority limiting factors for all life stages of the steelhead (e.g., lack of over-summering pools for smolts and older fish, rearing habitats for younger age classes, spawning habitats.) Describe a suite of project types to address these limiting factors. Prioritize stream reaches for steelhead habitat restoration based upon least cost/greatest gain.
- Steelhead Pool Development/Maintenance on San Antonio Creek. Surveys and monitoring of San Antonio Creek over the years have revealed the need for over-summering pools in the creek as a priority for steelhead recovery. Support steelhead survival by developing

and maintaining over-summering pools in strategic, least cost/greatest gain, perennial flow locations.

• Fish Passage. Modify priority fish passage barriers (e.g., Camp Comfort and Fraser Street).

## Engage the Community and Encourage Stewardship

• Friends of San Antonio Creek. Coordinate meetings of residents/ landowners along San Antonio Creek to foster and facilitate increased knowledge about watershed issues and stewardship. Address topics such as invasive plant removal, habitat restoration, steelhead habitat protection, permeable surfaces, stormwater retention, flooding awareness and preparation, and livestock BMPs.

## 2.3.7.5 **Organizations**

The following organizations and entities are actively supportive of the intent of the Healthy San Antonio Creek Campaign.

Casitas Municipal Water District City of Ojai City of Ventura/Ventura Water The Concerned Restoration and Environmental Workers Farm Bureau of Ventura County Meiners Oaks Water District Ojai Basin Groundwater Management Agency Ojai Valley Green Coalition Ojai Valley Land Conservancy **Resource Conservation District** Santa Barbara Channelkeeper Surfrider Foundation UC Cooperative Extension Ventura County Coalition of Labor, Agriculture and Business Ventura County Parks Department Ventura County Resource Conservation District Ventura County Watershed Protection District Ventura County Weed Management Area Ventura River Water District

# 2.4 **Complete List of Priority Projects and Programs**

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# 2.4 **Complete List of Priority Projects and Programs**

## 2.4.1 **Priority Project and Program** List Development

The first step in developing a priority list of projects and programs for achieving the watershed management plan's goals and objectives was to create a master list of ideas. This master archive of projects and programs (MAPP) represents an unedited, unranked repository of ideas large and small.

The creation of the MAPP began with a draft list of project and program ideas compiled by the watershed coordinator. Ideas were gleaned from a variety of sources: Watershed Council meetings, stakeholder conversations, past reports and plans, and other watershed management plans. Six technical advisory committees (TACs) of the Watershed Council held a series of meetings in March 2013 and again in May 2013 to further develop and refine this list.

### **Project/Program List Development Process**

- Step 1: Create Master Archive of Projects and Programs
- Step 2: Filter Projects and Programs into Tier 1 or Tier 2
- Step 3: Filter Tier 1 Projects and Programs by Those with Leads and Those Without Leads

The MAPP is maintained in a comprehensive spreadsheet that indicates a variety of features about each project or program idea, such as the goals and objectives it could satisfy, the general project type, estimated cost, and the organizations that are willing to lead or support the project. The MAPP is intended to be a living document that the Watershed Council can continue to add to over time. The second step in developing a priority project and program list was to categorize the projects assembled in the MAPP archive into one of two "tiers":

#### Tier 1 projects and programs are those that

- 1. Meet one or more of the plan objectives,
- 2. Are feasible,
- 3. Have clear benefit,
- 4. Have general stakeholder support, and
- 5. Have a project lead or supporter.

The third step in developing a priority project and program list was to categorize the Tier 1 projects and programs by whether they had a committed project lead or not. The Tier 1 projects and programs that have at least one lead represent the priority and "potentially ready" projects and programs. Those Tier 1 projects and programs with only supporters represent priority, but not quite ready, projects and programs.

**Tier 2 projects and programs** are all those that do not meet all Tier 1 criteria, and therefore are not yet ready to move forward with Council support, but remain on the MAPP as concepts.

### Leads and Supporters

Tier 1 projects and programs must have either a lead (Tier 1L) or a supporter (Tier 1S). A *lead* is defined is an organization that is willing and able to lead and/or be the grant applicant of the project/program. Being a lead does not represent a commitment to implement the project; lead status simply indicates a big enough interest in seeing the project implemented that the organization would consider leading it or pursuing funding under the right circumstances. A *supporter* is an organization willing to actively advance a project/program, but that is not in a position to be the lead.

The project and program list is not static. As circumstances and needs change, Council members may wish to elevate a project's status, such as from a Tier 1S to a Tier 1L, or add a new project or program. The list can be updated at any time with Council approval, and the most current list will be maintained on the Council's website.

## 2.4.2 **Priority Projects and Programs**

Table 2.4.2 represents the Council's Tier 1L list of projects and programs. The Tier 1L list describes those projects and programs that Council members are prepared to act on if funding becomes available. These are the projects/programs that are the most developed conceptually, the most feasible, and that have Council member support. Some of these projects are already occurring and would benefit from expansion or enhancement; and some of the projects are new. The implementation campaigns, discussed previously in this chapter, combine projects and programs from the Tier 1L list into coherent thematic strategies that reflect the on-the-ground integration of these various projects and programs.

The list of Tier 1S and Tier 2 Projects and Programs can be found in "4.4 Appendices."

Table 2.4.2.1	Tier 1L Price	ority Projects	and Programs
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ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	lmprove/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
	Goal 1: Sufficient Local Water S	upplie	S				
1	Surface Water-Groundwater Interaction Analysis. Increase under- standing about the interaction between groundwater extractions and surface flows. Install surface flow monitors at key locations, such as along San Antonio Creek at the Ventura River Basin-Ojai Basin bound- ary, and within the Ojai Basin. Look for correlations between pumping extractions and changes in surface flow.	x					L: Ventura Water, MOWD
5	Water Use Efficiency and Reuse Education. Promote and incentiv- ize water use efficiency and reuse (e.g., low-water-using landscapes; replacement of hobby orchards with lower-water-using landscapes; use of local, woody mulch; use of graywater systems and cisterns/rain barrels; high efficiency plumbing retrofits, fixing leaks, efficient use of agricultural irrigation water). Continue to promote the availability of large landscape irrigation efficiency survey and ag/hobby orchard irrigation efficiency evaluations. Continue/expand subsidies for equip- ment upgrades.			x			L: Ventura Water, RCD, OVGC
7	<b>Casitas MWD Reservoir Tank Seismic Retrofit.</b> Bring two Casitas MWD reservoir tanks up to earthquake standards to prevent potential seismic damage.		x				L: Casitas

ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	lmprove/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
8	Water Supply Infrastructure Reliability Improvements. Replace or retrofit aging or threatened water supply tanks, wells, pipes, and other conveyance and storage equipment to reduce water losses, ensure supply reliability, and bring up to earthquake standards. Install backup equipment to improve the watershed's resiliency to emergencies.		x				L: Casitas, MOWD S: Ventura Water
11	<b>On-Farm Water Detention/Retention Analysis</b> . Investigate opportunities for small-scale on-farm stormwater detention and storage options (e.g., swales, contours, wet ponds, rainwater harvesting, underground storage).	x					L: RCD S: RWQCB
12	<b>Contingency Water Storage</b> . Install decentralized contingency water storage.		x				L: Ventura Water
14	Water Supply System Loss Minimization. Reduce water supply losses from leaking pipes or inefficient equipment.		x				L: Casitas, Ventura Water, RCD
15	<b>Additional Flow Gauges.</b> Install streamflow gauges in key locations, such as on San Antonio Creek, to improve understanding about surface flow patterns relative to groundwater levels.	x					L: OBGMA
16	Water Rate Analysis. Research creative water rate model options that strongly incentivize conservation while covering district costs. Analyze the relative amount of funding spent by local water suppliers on conservation.	x					L: Casitas
17	<b>Reclaimed Water Analysis</b> . Investigate the opportunities for and fea- sibility of using reclaimed water from the Ojai Valley Sanitary District, such as during winter flows when the water is not so critical in the river. (Per state policy, recycled water cannot be used until a Salt and Nutrient Management Plan is completed.)	x					L: Ventura Water S: OVSD
18	<b>Conjunctive Use Study</b> . Investigate opportunities for maximizing the efficiency of use and storage between surface and groundwater.	x					L: Casitas, Ventura Water
19	<b>Ocean/River Friendly Gardens Education Program.</b> Expand the Ocean/River-Friendly Gardens program (conservation, rainwater harvesting, non-polluting) watershed-wide; integrate incentives.			x			L: OVGC, Surfrider S: Ventura Water
22	Large Landscape Irrigation Efficiency Surveys/Upgrades. Continue to promote the availability of Casitas's free landscape irrigation efficiency surveys; continue or expand subsidies for equipment upgrades.			x			L: Casitas
23	<b>Ventura Water - Casitas Conduit Intertie.</b> Install a new 5.5 mile pipeline from Lake Casitas to the City of Ventura, and a pump station, to provide Casitas with a backup for potential water service delivery interruption to the Rincon area and to improve the City of Ventura's water supply reliability and system operational abilities.		x				L: Ventura Water S: RWQCB

ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	lmprove/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
25	<b>OVSD Sewer Main Lining Study.</b> Prevent infiltration of groundwater into sewer lines by lining existing sewer pipes. Up to 7.5 million gal/day of groundwater infiltrate the sewer pipes during storm events. That's 23 acre-feet of water a day.	x					L: OVSD S: OBGMA
26	Casitas MWD Exposed Main Line (San Antonio Creek) Burial. Bury this important gravity main line for improved protection.		x				L: Casitas
27	Ventura Water Foster Park Wellfield Restoration. Install additional wells in the Foster Park area to allow the City of Ventura to produce more water from the river when flows are high. Ventura faces the chal- lenge of meeting water demands in ways that protect and enhance the steelhead. New wells at Foster Park will allow the City to better assure that adequate surface flow is available at critical times to sup- port steelhead migration, spawning, and rearing.		x				L: Ventura Water
29	Ventura Water North-Side Satellite Wastewater Treatment Plant. Install a small, 2 million gallons/day (mgd) tertiary wastewater treat- ment plant near the Fairgrounds to treat wastewater from the West- side of Ventura for reuse. The recycled water could meet ag demand (1 mgd avg., 1.8 mgd max/mo.) and urban demand (0.23 mgd avg., 0.33 mgd max/mo.). Provides a small water supply benefit by offsetting potable demands for urban irrigation. Ag recycled water use would reduce groundwater extractions. While the supply/demand is rela- tively small, there are advantages to this alternative: the availability of city-owned property at the Seaside Pump Station for treatment facili- ties, the low chloride and TDS concentrations in the wastewater, and the similarity between the available supply of recycled water and the demand in the vicinity of the Seaside Pump Station. (Per state policy, recycled water cannot be used until a Salt and Nutrient Management Plan is completed.)		x				L: Ventura Water
31	<b>Native and Climate Appropriate Plant Education.</b> Develop and implement an education program that promotes landscaping with natives and other climate-appropriate plants.			x			L: Casitas
34	<b>Plumbing Fixture Retrofit Policy Enforcement:</b> Monitor enforcement of the Ojai Area Plan policy that stipulates that new development must not add any net increase demand to existing water supplies. This is achievable through mitigation such as off-site plumbing retrofits. "New discretionary development shall be required to retrofit existing plumb- ing fixtures or provide other means so as not to add any net increased demand on the existing water supply. This policy shall be applicable until such time as a groundwater basin study is completed and it is found that the available groundwater, or other sources of water, could adequately provide for cumulative demand without creating an over- draft situation."				x		L: Council
35	Meiners Oaks WD Replacement Water Well. Replace a potable water well built in the 1950s.		x				L: MOWD

ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	lmprove/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
36	Meiners Oaks WD Standby Electric Generator. Install a standby gen- erator to maintain water supply and fire flows in a critical zone during an extended power outage.		x				L: MOWD
37	<b>Meiners Oaks WD Water Tank Replacement.</b> Replace an aging bolted steel 500,000-gallon water tank with a welded steel tank with concrete ringwall.		x				L: MOWD
39	Agricultural and Hobby Orchard Irrigation Efficiency Evaluations. Continue to promote the availability of the Resource Conservation District's free irrigation efficiency evaluation program (Mobile Irriga- tion Lab) for farms and hobby orchards; continue or expand subsidies for equipment upgrades.			х			L: RCD, Casitas S: Colab
41	Foster Park Infrastructure and Bank Protection and Restoration. Prevent critical infrastructure loss (such as in the 2005 storms) and support the development of steelhead habitat by building groins, revegetating the banks and preventing bank erosion. This reach, which is critical riparian habitat for steelhead, includes the city of Ventura's wellfield, a portion of Ojai Valley Sanitary District's sewer trunk line and a Casitas MWD main water line - all critical infrastructure that needs protection from storms. A bank protection design has been devel- oped, with input from resource agencies, which would allow habitat to re-establish on its own and support steelhead spawning.		x				L: Ventura Water S: OVSD
42	Groundwater Data Loggers. Install and maintain data loggers in key wells to continuously track water level and other parameters.	x					L: OBGMA
43	<b>Direct Installation of High Efficiency Irrigation Equipment on Large Landscapes.</b> Provide irrigation surveys for large landscapes along with installation of appropriate water-saving technologies (e.g., low-precipitation rate nozzles, rain shut-off sensors, weather-based controllers) by a professional installer.		x				L: Casitas
46	<b>Land Subsidence Monitoring.</b> Establish a land subsidence monitoring network using real time kinematic GPS to measure changes in ground elevation due to groundwater pumping-related subsidence.	x					L: OBGMA
	Goal 2: Clean Water						
49	<b>OVSD Sewer Trunk Relocation - Ventura River.</b> Relocate a sewer line in the Ventura River threatened by river flow. A sewer line break here would affect water companies, instream uses, and ocean water quality.		x				L: OVSD
51	<b>OVSD Sewer Trunk Relocation - Ventura River/Meiners Oaks</b> . Remove an old sewer line that crosses the river that could become a dam and steelhead impediment if the level of the riverbed drops.		x				L: OVSD
52	<b>Livestock Nutrient Management Program.</b> Promote livestock nutrient best management practices (BMP) (e.g., rotational grazing, off-stream water facilities and salt/supplement feeders, the installation of stream/river exclusionary fencing where appropriate, and erosion control); offer water quality assessments, BMP design, and technical assistance.			x			L: RCD S: RWQCB, CCC, SBCK

ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	lmprove/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
53	Slow It/Spread It/Sink It Campaign. Coordinate an educational program to advance onsite rain/stormwater harvesting at residences, churches, schools and businesses; integrate incentives, demonstration projects, and showcase individual examples.			x			L: OVGC, SBCK, S: Ventura, CCC, RCD
54	Farm and Stable Nutrient Management Program. Promote farm and stable nutrient management best management practices (BMP) (e.g., filter strips, rainwater collection, manure management, erosion control, off-stream watering); offer on-farm/stable evaluations, BMP design, and technical assistance; identify priority parcels for livestock BMP implementation. Include Spanish-language component and demonstration projects. Showcase individual examples.			x			L: RCD S: RWQCB
55	<b>Coordinated Water Quality Monitoring.</b> Investigate opportunities to coordinate the various water quality monitoring programs to reduce redundancy, and improve the cost-effectiveness and utility of the data, such as by sharing monitoring locations, standardizing protocols and formats, and sharing data.					x	L: OVSD, WPD S: RWQCB, SBCK
56	<b>Adopt-a-River Program.</b> Coordinate a program that enlists service organizations, youth groups, businesses, and others to commit to river/stream/channel/trail cleanup, such as collection events on Calif. Coastal Cleanup Day, ongoing dog mitt dispenser/maintenance on major trails, and ongoing horse manure collection on major trails.			x			L: VHC, SBCK, County of Ventura, Ventura S: OVGC
57	Friends of San Antonio Creek. Coordinate meetings of residents/ landowners along San Antonio Creek to foster and facilitate increased knowledge about watershed issues, and stewardship. Address invasive plant removal, habitat restoration, steelhead habitat protection, permeable surfaces, stormwater retention, flooding awareness and preparation, livestock BMPs, etc.			x			L: RCD S: Ojai, SBCK
58	Stormwater Retrofit Plan (LID and Green Streets). Develop a plan that inventories, assesses and prioritizes opportunities to retrofit impervi- ous surfaces with alternative approaches (e.g., low impact develop- ment [LID] and green streets) that capture, treat, and infiltrate urban stormwater runoff. This may include public properties - such as public rights-of-way, street medians, sidewalks, parking lots and parks - as well as private properties, where public-private partnerships are pos- sible. This planning will include soils investigations and development of preliminary retention calculations and design volumes based on prioritized ranking of parcel size, soil percolation rates and depths to groundwater.	x					L: Ventura, County of Ventura, SBCK S: RWQCB, OVGC
59	Water Pollution Prevention Campaign. Coordinate an educational program to prevent nonpoint source pollution (nutrients, pesticides/ herbicides, trash, pharmaceuticals, etc.).			x			L: Ventura, WPD, SBCK S: RCD
60	<b>Prevent Illegal River Bottom Camps.</b> Support the work of the City of Ventura, County of Ventura, law enforcement, and social service organizations to prevent illegal activities in the river.					х	L: Ventura, SBCK S: Friends, County of Ventura

ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	Improve/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
61	<b>In-Situ Water Quality Monitoring Equipment.</b> Install multi-parameter monitoring equipment to continuously monitor water quality in the river system, including dissolved oxygen.	x					L: SBCK S: OVSD
63	<b>Stormwater Retrofit Demonstrations (LID and Green Streets).</b> Retrofit impervious surfaces with alternatives (e.g., low impact development and green streets) that capture, treat, and infiltrate urban stormwater runoff in order to demonstrate the use of bioretention systems, permeable surfaces, runoff treatment, infiltration and the restoration of natural hydrological functions in urban areas. May include public properties - such as public rights-of-way, street medians, sidewalks, parking lots and parks - as well as private properties, where public-private partnerships are possible. Prominent public locations will be prioritized when feasible.		x				L: Ventura, County of Ventura S: RWQCB, SBCK
64	Ventura River Stream Team Citizen Monitoring Program. Continue this citizen water quality monitoring program that provides impor- tant, long-term water quality data throughout the watershed, while empowering, educating, and engaging residents.	x					L: SBCK
65	Manure/Composting Storage Demonstration Site. Install a manure/ composting bunker or similar system, as a demonstration site at a horse facility.			х			L: RCD
66	<b>Dry Weather and/or First Flush Diversions.</b> Install devices to capture dry weather and/or first flush contaminated stormwater and send directly to the wastewater treatment plant.		x				L: Ventura S: Ojai, RWQCB, OVSD
72	Ventura Water San Jon/Prince Barranca Urban Stormwater/Flood Control Retrofit Pilot Project. Retrofit parking and recreation areas, construct detention basins, and upgrade storm drains in order to enhance infiltration, water conservation, stormwater reuse, and urban flood protection. (In IWPP as channel/drainage improvements. Techni- cally outside of the watershed proper.)		x				L: Ventura, WPD S: Surfrider
73	<b>Brownfield Project Remediation.</b> There are 30 brownfield sites in the Westside and North Ventura Avenue areas of the city of Ventura that are potentially contaminated with hazardous substances and that could pose a threat to groundwater. Assist property owners with securing funding to clean up these sites.		x				L: Ventura
74	<b>Single-Use Bag Ban.</b> Promote adoption of a single-use bag ban by the County of Ventura and City of Ventura (already adopted by City of Ojai).				x		L: SBCK S: Matilija C, Surfrider, OVGC, County of Ventura

ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	lmprove/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
75	Septic System TMDL Special Study. Conduct a study to identify those septic systems, either individually or by geographic area, that are con- tributing to the impairment of surface waters in the watershed. This will facilitate a focused application of available resources to reduce or eliminate the contribution of these systems to water quality impair- ments, and more effectively meet the requirements of the state's AB 885 policy and TMDL requirements.	x					L: EHD S: Ojai, RWQCB, SBCK, OVSD
76	<b>Geologic Nitrogen Sources - TMDL Special Study.</b> Conduct a special study to determine the extent to which the natural Monterey Formation contributes nutrients to water systems.	x					L: CoLab S: RWQCB
77	<b>Stormwater Parking Lot Retrofits.</b> Retrofit parking lots and their landscapes to improve stormwater capture and infiltration, where feasible (given clay soils and high groundwater) as they come up for rehabilitation.		x				L: Ojai
78	<b>Trash Excluders.</b> Retrofit catch basins with trash excluders to filter trash from storm flows.		x				L: Ojai
186	<b>Cleanup Petrochem.</b> The blighted and abandoned oil refinery has marred the view, threatened the water quality, and impaired recreational values of the lower Ventura River for decades. Work to have the facility removed and cleaned up by the responsible parties.		x				L: County RMA
	Goal 3: Integrated Flood Manag	jemen	t				
79	Bring Levees up to FEMA Standards - Casitas Springs Levee. (Also Matilija Dam Removal Mitigation) Complete levee improvements required to meet FEMA certification requirements and as part of the Matilija Dam Ecosystem Restoration Project.		x				L: WPD S: Coastal Cons.
80	Bring Levees up to FEMA Standards - Live Oaks Levee. (Also Matilija Dam Removal Mitigation) Complete levee improvements required to meet FEMA certification requirements and as part of the Matilija Dam Ecosystem Restoration Project.		x				L: WPD S: Coastal Cons.
82	Matilija Dam Removal - Mitigation: Meiners Oaks Levee. Construct new Meiners Oaks Levee/floodwall - part of the Matilija Dam Ecosys- tem Restoration Project.		x				L: WPD
84	Matilija Dam Removal - Mitigation: Santa Ana Bridge Upgrades. Widen and upgrade Santa Ana Bridge - part of the Matilija Dam Eco- system Restoration Project.		x				L: WPD S: OVSD
85	Matilija Dam Removal - Mitigation: Camino Cielo Bridge Replace- ment. Replace Camino Cielo Bridge - part of the Matilija Dam Ecosys- tem Restoration Project.		x				L: WPD
86	Bring Levees up to FEMA Standards - Ventura River Levee and Park- way Enhancement. Complete levee improvements required to meet FEMA certification requirements, and create safe access to the lower river for recreation.		x				L: WPD S: Coastal Cons.

ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	lmprove/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
87	<b>Canada de San Joaquin Bank Stabilization.</b> Fix severe bank erosion and degrading invert. Service road is threatened, followed by homes above bank. Construct grade stabilizers; protect banks from erosion; acquire right-of-way. (IWPP)		x				L: WPD
91	<b>Channel Improvements - Canada Larga.</b> Make creek shortcut (from 2005 flood) permanent. Excavate 1,500' long channel and/or build levees to provide flood protection. (IWPP)		x				L: WPD
92	<b>Debris Basin Installation/Maintenance - Coyote Creek.</b> Excessive debris and sediment in channel. Implement routine debris clean out; build debris basin at mouth of Red Mountain Canyon. (IWPP)		x				L: WPD
93	<b>Right-of-Way Acquisition - Coyote Creek.</b> ROW needed to get access for repairs and maintenance. (IWPP)		x				L: WPD
94	<b>Channel Improvements - Dent Drain Outlet.</b> Ventura River bank erosion threatening headwall and flapgate. Construct upstream rock riprap groin. (IWPP)		x				L: WPD
95	<b>Debris Basin Installation/Maintenance - Dron Creek.</b> Very high sedi- ment yield; fills channel and causes flooding. Develop design that minimizes downstream erosion. Construct debris basin in canyons north of Gridley Rd. (IWPP)		x				L: WPD
96	Channel Improvements - Rebuild East Ojai Drain. Undersized drain needs enlarging. (IWPP)		x				L: WPD
97	<b>Channel Improvements - Fox Barranca.</b> Replace the existing concrete channel and increase flow capacity. (IWPP)		x				L: WPD
98	<b>Right-of-Way Acquisition - Fox Canyon Debris Basin.</b> ROW needed to get access for maintenance. (IWPP)		x				L: WPD
99	<b>Right-of-Way Acquisition- Fresno Canyon Flood Mitigation.</b> ROW needed to get to levee and end of Fresno Cnyn from Edison Drive. (IWPP)		x				L: WPD
100	<b>Debris Basin Installation/Maintenance - Fresno Canyon Flood Miti- gation.</b> Construct a reinforced concrete pipe diversion from upstream of Highwy 33 to Ventura River. The purpose of this project is to protect the community of Casitas Springs from a 100-year flood in Fresno Canyon. (IWPP)		x				L: WPD
101	<b>Channel Improvements - Howard Ave. Drain.</b> No access road to main- tain earth channel. Extend 36" pipe upstream 1060 feet. (IWPP)		x				L: WPD
102	Right-of-Way Acquisition - Manuel Canyon. ROW needed to get access for repairs and maintenance. (IWPP)		x				L:WPD
103	Flood Modeling - McNell Creek Flood Mitigation. Creek is undersized and carries a heavy sediment load. Use modeling to plan improve- ments. (IWPP)	x					L: WPD

ID#	Tier 11 Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	lmprove/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
104	Flood Modeling - Thacher Creek Flood Mitigation. Creek is under- sized and carries a heavy sediment load. Use modeling to plan improvements. (IWPP)	x					L:WPD
105	<b>Right-of-Way Acquisition - Parkview Drain</b> . ROW needed to get access for maintenance. (IWPP)		x				L: WPD
106	<b>Debris Basin Installation/Maintenance - Senior Canyon.</b> Crossings are undersize and debris deposition a problem. Design and construct a new debris/detention basin at the abandoned basin site. (IWPP)		x				L: WPD
108	<b>Channel Improvements - Skyline Drainage Rock RipRap Stabilizer</b> . Erosion at outlet threatening adjacent bank and trail/access road. Reconstruct concrete rock outlet. (IWPP)		x				L: WPD
109	<b>Channel Improvements - Thacher Creek - Grand Ave.</b> Calif crossing (bridgeless stream crossing) interrupts sediment transport; local flood- ing. Replace crossing with a bridge. (IWPP)		x				L: WPD
110	Channel Improvements - Thacher Creek @ Siete Robles. Community subject to flooding from inadequate channel. Replace. (IWPP)		x				L: WPD
111	Ventura River Integrated Watershed Protection Plan Annual Update. Update the IWPP and include a comprehensive survey and engineer- ing analysis of the watershed's drainage infrastructure and cost/ benefit of improvements. Consider infrastructure needs in light of megastorm scenarios. Ensure integration of the watershed manage- ment plan's flood management priorities in the IWPP. (IWPP)	x					L: WPD
112	<b>Channel Improvements - Vince Street Drain Outlet to Ventura River.</b> Make improvements to prevent Ventura River flooding and sedimenta- tion of earth channel and inlet to culvert. (IWPP)		x				L: WPD
113	<b>ARkStorm Scenario Drill.</b> Develop response plans for a megastorm hitting the watershed and test the plans with a full-scale real-time exercise. Work with emergency services, water and sanitary districts, the media, and local and state government.					x	
114	<b>100-Year Flood Event Drill.</b> Work with Watershed Protection Dis- trict, Public Works Transportation, water and sanitary districts, and local governments to stage a 100-year flood event exercise in the watershed.					x	L: WPD
115	Flood Control Project Design. Participate in the Watershed Protection District's pre-design stakeholder process for flood control projects.					x	L: Council
116	<b>Stormdrain Improvements - Ojai Avenue (Eastside).</b> Area subject to flooding.		x				L: Ojai
117	Culvert Improvements - Maricopa Hwy at Besant Meadow. Area subject to flooding.		x				L: Ojai

ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	lmprove/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
	Goal 4: Healthy Ecosystem	าร					
118	<b>Matilija Dam Removal - Interim Notch of Matilija Dam.</b> Notch the dam down to the existing sediment level.		x				L: WPD S: Coastal Cons., Matilija
119	<b>Matilija Dam Removal</b> . Remove dam to restore sediment transport and access for migrating steelhead, and eliminate the dam failure hazard.		x				L: WPD, Coastal Cons. S: Matilija C.
120	<b>Matilija Dam Removal - Desilting Basin</b> . Construct a desilting basin for diverted surface water before it enters Casitas Reservoir - part of the Matilija Dam Ecosystem Restoration Project.		x				L: WPD Coastal Cons.
121	Matilija Dam Removal - Mitigation: Robles Diversion High Flow Bypass. Construct three additional gates and appurtenant work to allow expected additional sediment to pass by the Robles Diversion -part of the Matilija Dam Ecosystem Restoration Project.		x				L: WPD S: Coastal Cons.
124	<b>Matilija Dam Removal - Sediment Removal</b> . Remove and dispose of sediment behind the dam - part of the Matilija Dam Ecosystem Restoration Project.		x				L: WPD, Coastal Cons.
125	Matilija Dam Removal - Mitigation: Invasive Plant Removal and Retreatment. Retreat areas where <i>Arundo</i> and other invasive spe- cies have been removed, from Matilija down to Hwy 150 - part of the Matilija Dam Ecosystem Restoration Project.		x				L: WPD S: Coastal Cons., OVSD
126	<b>Confluence Wetland Mitigation.</b> Casitas Springs Levee runs through natural wetland at confluence of Ventura River and San Antonio Creek. Lower and realign levee so wetland can be restored. (IWPP)		x				L: WPD
127	<b>Invasive Plant Task Force.</b> In collaboration with the County Weed Mgmt. Area, establish an invasive plant task force in the watershed to share knowledge/resources, prioritize areas for removal, ensure state-of-the-art procedures are employed, study innovative alternatives, streamline permitting, establish protocols that ensure pesticide use is minimized and maximally effective, and to develop public information materials on the dangers of <i>Arundo</i> and other invasives.					x	L: Council
128	<b>Invasive Plant Removal.</b> Remove and monitor <i>Arundo</i> and other invasive non-native species that threaten aquatic habitats.		x				L: OVLC, VHC S: Coastal Cons., Ojai
129	<b>Steelhead Habitat Enhancement.</b> Support steelhead recovery by creating and maintaining in-stream habitat that supports all life stages of the steelhead. Examples include large woody debris, spawning gravel, riffles, riparian cover and rock outcroppings. Where feasible start with strategic, perennial flow, least cost/greatest gain locations.		x				L: VHC, OVLC, CCC S: Casitas, Ventura Water

ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	lmprove/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
130	<b>Fish Passage.</b> Remove fish passage barriers (e.g., Matilija Dam; bar- riers at Wheeler Campground, Ojai Rock Quarry, Camp Comfort and Fraser Street).		x				L: RCD S: Coastal Cons, CCC, Casitas, Matilija
132	Steelhead Pool Development/Maintenance on San Antonio Creek. Support steelhead survival by developing and maintaining over- summering pools in strategic, least cost/greatest gain, perennial flow locations. San Antonio Creek (SAC) offers some of the best habitat for relatively quick improvements to the recovery of steelhead in the watershed.		x				L: OVLC, CCC S: Coastal Cons, Casi- tas, Ventura Water
133	<b>Steelhead Restoration Plan.</b> Consolidate existing watershed-specific steelhead data (e.g., habitat, population and monitoring data). Identify priority limiting factors for all life stages of the steelhead (e.g., lack of over-summering pools for smolts and older fish, rearing habitats for younger age classes, spawning habitats.) Describe a suite of project types to address these limiting factors. Prioritize stream reaches for steelhead habitat restoration based upon least cost/greatest gain.	x					L: CDFW S: Ventura Water
135	Land Protection Plan. Establish land acquisition priorities that best serve the goals and objectives of the watershed management plan (e.g., integrated flood management, water infiltration, public access to nature, habitat connectivity, healthy ecosystems, natural water treatment).	x					L: OVLC, VHC S: TPL
138	Land and Public Access Protection. Acquire land or conservation easements from willing landowners that provide important watershed functions and values (e.g., integrated flood management, water infil- tration, public access to nature, habitat connectivity, healthy ecosys- tems, natural water treatment).		x				L: OVLC, VHC S: Coastal Cons., TPL
140	Wildlife Connectivity Study. Identify and map wildlife connectivity hot spots.	x					L: VHC
141	<b>Protected Tree Mitigation Fees.</b> Amend Ventura County procedures to allow tree protection mitigation fees to go directly to local conservation entities for restoration work.				x		L: VHC, County Planning S: OVLC
142	<b>Efficient Conservation Subdivision Permit Process.</b> Work with those seeking a conservation subdivision and the Ventura County Planning Division to help make the conservation subdivision process as efficient and inexpensive as possible.				x		L: OVLC, VHC
143	<b>Riparian Habitat and Wetland Restoration.</b> Restore (conservancy-, publicly-, and privately-owned) riparian habitats and wetlands to promote native vegetation growth to benefit fish and wildlife, promote attenuation of flood flows, capture of sediments, treatment of runoff, infiltration and to deter algae growth.		x				L: OVLC, VHC, CCC S: RWQCB, Casitas, Coastal Cons., OVGC
### Table 2.4.2.1 Tier 1L Priority Projects and Programs (continued)

ID#	Tier 1L Proiect or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	Improve/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
Arundo Removal in San Antonio Creek at Camp Comfort. Remove       144     Arundo growing within the 2,500-foot stretch of the San Antonio Creek     x       that runs through Camp Comfort.					L: OVLC S: Parks, RCD, CCC		
146	San Antonio Creek Restoration at Soule Park Golf Course. Restore         this stretch of creek by stabilizing the bank and reestablishing riparian         x			L: Parks S: Casitas			
147	Invasive Plant Removal and Retreatment - San Antonio Creek. Retreat, for 10 years, areas where <i>Arundo</i> and other invasive plants were removed on San Antonio Creek.		x				L: WPD S: CCC
148	<b>Mitigation Bank.</b> Develop a local mitigation bank as a means to protect and restore existing or degraded wetlands or other sensitive habitats, while providing a mechanism for effective mitigation of development-related impacts.				x		L: Colab
149	<b>Steelhead Preserve Education and Conservation Center.</b> Develop a comprehensive watershed education center at the 70-acre historic Hollingsworth Ranch along the Ventura River between Ventura and Ojai. Include displays and demonstrations that interpret and animate the natural and cultural history of the watershed, and community and educational events will be hosted.			x			L: OVLC S: Coastal Cons.
150	<b>Ventura River Parkway Plan.</b> Develop and implement a phased Ven- tura River Parkway Plan that will improve public access to the river and trail opportunities along the river by working with willing landowners on a voluntary basis.	x					L: Coastal Cons., OVLC S: RWQCB, Friends, CCC
	Goal 5: Access to Nature	}					
151	<b>Trail Guides.</b> Create and distribute trail guides that describe the trails and access points, as well as information on the watershed's ecosystems and the important services and values they provide.			x			L: Friends S: Coastal Cons.
156	<b>New Family Picnic Areas/Parks.</b> Install vehicle-accessible parks and picnic areas that offer family access to aquatic habitats.		x				L: OVLC S: Coastal Cons.
157	<b>New Trails.</b> Install sustainably designed new trails and look for appropriate opportunities to serve different types of trail users (walkers, hikers, ADA, bicycle, equestrian).		x				L: OVLC S: Coastal Cons., VHC
159	<b>Easements and Acquisitions for Lower Ventura River Public Access.</b> Where appropriate, secure public access to the lower Ventura River, such as access to the levee and the under-freeway culvert (now used illicitly) that connects the levee to Ventura Avenue.		x				L: Coastal Cons., VHC, Friends
163	<b>Interpretive Signs</b> . Install and maintain watershed interpretive signs at special/high profile watershed locations and easily accessible river viewpoints.			x			L: OVLC S: Coastal Cons., CCC, VHC, OVGC, Friends

### Table 2.4.2.1 Tier 1L Priority Projects and Programs (continued)

ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	lmprove/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
<ul> <li>Maintain and Improve Existing Trails and Access Locations. Make improvements to existing trails and access locations, such as by expanding access by different types of trail users (walkers, hikers, ADA, bicycle, equestrian). Continue to keep trails accessible and safe, and increase efforts to reduce erosion and related sediment inputs into waterways.</li> </ul>			x				L: OVLC S: VHC
	Goal 6: Responsible Land and Resource	e Mana	ageme	nt			
165	<b>Development Project and New Policy Monitoring.</b> Review and comment on proposed land use projects and policies - by the three local governments in the watershed - on an ongoing basis.				x		L: Council
167	<b>Extended Drought/Climate Change Preparation.</b> Facilitate ambitious, coordinated emergency planning, preparedness, and response for extended droughts.					x	L: Casitas S: Ventura
169	<b>Mixed Use Zoning.</b> Amend Ventura County's and the City of Ojai's zon- ing ordinances to allow appropriate mixed use zoning in urban com- munities in order to advance our watershed goals, such as minimizing impervious cover and open space loss.				x		L: Ojai, County Planning
171	Water Efficient Crop Study. Research the feasibility of alternative crops in the watershed that are economically sustainable and low-water using. (Asian Citrus Psyllid contingency plan.)	x					L: RCD
172	<b>North Ventura Avenue Area Plan.</b> Update Ventura County's North Ventura Avenue Area Plan (integrate appropriate mixed use, LID, Parkway access, mobility, etc.).				x		L: County Planning
173	<b>Agricultural Best Management Practices.</b> Promote agricultural best management practices (e.g., efficient irrigation and nutrient management, use of mulch or compost, swales and grassed drainages, habitat protection, pollution prevention).			x			L: Casitas, RCD S: Coastal Cons.,CCC, Colab
	Goal 7: Coordinated Watershed F	Planni	ng				
174	Watershed and River Signs. Install and maintain "Entering Ventura River Watershed" highway signs and watercourse crossing signs along major roads crossing the Ventura River and its tributaries.			x			L: WPD S: OVGC
175	Watershed Education Center. Support the efforts of the Ojai Valley Land Conservancy to develop a comprehensive watershed education center to serve as a center of learning on all aspects of the watershed and its management. Include education/stewardship for youth and Spanish-speakers; facilitate student and low-income access to the center; integrate Chumash information.			x			L: OVLC
178	Watershed Council - Council and Coordinator. Develop ongoing funding for the watershed coordinator and Watershed Council, or form a different organizational vehicle to achieve watershed management goals. Maintain Council website and serve as a data and information clearinghouse. Coordinate the implementation campaigns.					х	L: Council S: RCD

### Table 2.4.2.1 Tier 1L Priority Projects and Programs (continued)

ID#	Tier 1L Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	Improve/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
179	Watershed Council - Watershed Management Plan. Maintain a "living" watershed management plan by updating and redistributing the plan every 3 to 5 years.					x	L: Council
182	Watershed Council - Watershed Management Plan Performance Evaluation. Develop an annual performance evaluation program to track the performance and effectiveness of the watershed manage- ment plan.					x	L: Council
183	<b>Youth Education.</b> Support programs that engage youth in the water- shed, such as the "Once Upon a Watershed" education program and youth camps that take youth out to nature.			x			L: Casitas, OVLC, Friends S: WPD, Ventura Water, Ventura
184	Watershed Stewardship Opportunities. Continue and expand oppor- tunities for citizens to learn about good stewardship and participate directly in stewardship projects.			х			L: Council
185	Watershed Curriculum. Develop a Ventura River watershed curriculum using the maps and information developed for the watershed management plan. Distribute to local public and private schools.			x			L: Council

Note: "ID#" in the table is only a reference number and does not indicate priority.

1L = A Tier 1 project or program which has a "lead"—an entity or organization willing to lead the project or be the grant applicant.

#### Abbreviations:

CCC—California Conservation Corps	OVGC—Ojai Valley Green Coalition
Casitas—Casitas Municipal Water District	OVLC—Ojai Valley Land Conservancy
Coastal Cons.—California Coastal Conservancy	OVSD—Ojai Valley Sanitary District
Colab—Ventura County Coalition of Labor, Business,	Parks—Ventura County Parks Department
and Agriculture	RCD—Ventura County Resource Conservation District
Council—Ventura River Watershed Council	RWQCB—California Regional Water Quality Control Board –
County of Ventura—County of Ventura, Public Works	Los Angeles District
County Planning—Ventura County Planning Division	SBCK—Santa Barbara Channelkeeper
County RMA—Ventura County Resource Management Agency	SCC—State Coastal Conservancy
EHD—Ventura County Environmental Health Division	Surfrider—Ventura Chapter of the Surfrider Foundation
Friends—Friends of Ventura River	TPL—Trust for Public Lands
Matilija C.—Matilija Coalition	WPD—Ventura County Watershed Protection District
MOWD—Meiners Oaks Water District	Ventura—City of Ventura
OBGMA—Ojai Basin Groundwater Management Agency	Ventura Water—City of Ventura's Water Division
Ojai—City of Ojai	VHC—Ventura Hillsides Conservancy

# Ventura River Watershed Management Plan



## PART 3

# Watershed Characteristics

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## 3.1 Overview and Quick Facts

Lake Casitas Photo courtesy of Michael McFadden



### 3.1 Overview and Quick Facts

"Watershed Characterization," Part 3 of this plan, provides an overview of the current physical, biological, hydrological, and social conditions of the Ventura River watershed. Prepared with the latest available technical data and information and input from a multi-stakeholder review, the Watershed Characterization is intended to help all stakeholders, including water managers, policy makers, regulators, residents, businesses, and students, better understand the watershed and its many interdependent relationships.

The characterization is data-rich—featuring photos, maps, graphics and explanatory sidebars—but is intended to be engaging and easily understandable by lay readers. Each section includes a list of the key documents on that topic where readers can find more detailed and technical information.



Aerial View of Ventura River Watershed Looking Downstream

### 3.1.1 Quick Facts

**Location:** The Ventura River watershed is located in southern California, in western Ventura County, with a small section in the northwest corner located in eastern Santa Barbara County. At 226 square miles, it is the smallest of the three major watersheds in Ventura County, which are the Ventura River, Santa Clara River, and Calleguas Creek watersheds.

Table 3.1.1.1	Ventura	County's	Major	Watersheds

	Square Miles	Acres
Ventura River	226	144,833
Calleguas Creek	343	219,520
Santa Clara River	1,634	1,045,760



Figure 3.1.1.1 Location Map

The watershed is fan-shaped: It measures 18 miles north to south, is 17 miles at its widest point and 1.3 miles wide at its narrowest point, the estuary.

Main Tributaries & Subwatersheds	Matilija Creek, North Fork Matilija Creek, San Antonio Creek, Cañada Larga Creek, Coyote Creek
Jurisdictions	Of the watershed area in Ventura County: County of Ventura (49.1%), US Forest Service (47.7%), City of Ojai (1.9%), City of Ventura (1.2%). A small corner of the watershed is in Santa Barbara County (3.9% of the entire watershed).
Population	44,140
Headwaters	Transverse Ranges
Mouth	Pacific Ocean (Santa Barbara Channel)
Length	33.5 miles (16.2 miles of main stem, plus 17.3 miles of Matilija Creek headwaters)
Area	226 sq. mi., 144,833 acres
Average Annual Precipitation	15.46" (lower watershed)
	21.31" (middle watershed) 35.17" (upper watershed)
Median Annual Precipitation	14.12" (lower watershed)
	19.20" (middle watershed) 28.74" (upper watershed)
Discharge	Average – 65 cubic feet per second (cfs); Maximum – 63,600 cfs (1978)
Elevation	Highest: 6,010 ft. Lowest: sea level

#### Table 3.1.1.2 Quick Facts

The Ventura River runs through the center of the watershed, draining numerous tributaries along a 33.5-mile run from its headwaters in the Transverse Ranges to the Pacific Ocean. The main stem of the Ventura River originates at the junction of Matilija Creek and North Fork Matilija Creek, 16.2 miles from the Pacific Ocean.

**Subwatersheds:** The Ventura River is fed by five significant tributaries that form "subwatersheds" nested within the larger Ventura River watershed. These tributaries, and subwatersheds, include Matilija Creek, North Fork Matilija Creek, San Antonio Creek, Cañada Larga Creek, and Coyote Creek. Ridges form the rims of these subwatersheds. The main stem of the Ventura River forms a sixth subwatershed.

### **Subwatershed Relationships**

Subwatersheds exhibit the same intra-relationship dynamics as the larger watersheds of which they are part. For example, groundwater levels in the San Antonio Creek subwatershed affect streamflow in the San Antonio Creek, which can affect the creek's water quality and availability of instream habitat for fish. Subwatersheds also have inter-relationships with the larger watershed. For example, the quality of water in San Antonio Creek ultimately affects the quality of water in the Ventura River watershed's estuary.