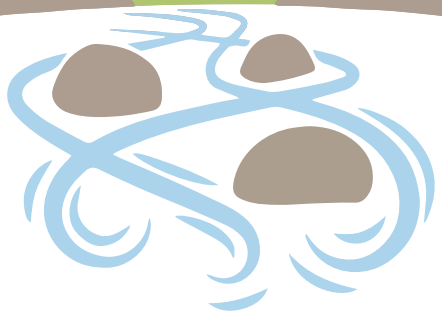

PART 4

References and Supporting Materials

4.1 Acronyms

ACP	Asian Citrus Psyllid
AEP	Annual Exceedance Probability (Flood)
AF	Acre-Feet
AF/yr	Acre-Feet per year
APCD	Ventura County Air Pollution Control District
AQMP	Air Quality Management Plan
BMP	Best Management Practice
BOR	Bureau of Reclamation
BPG	Biogeographic Population Group
CalPoly	California Polytechnic University Pomona
CCC	California Conservation Corps
CCR	California Code of Regulations
CDBW	California Department of Boating Waterways
CDPH	California Department of Public Health
CEC	constituents of emerging concern
CEQA	California Environmental Quality Act
CFP	California Floristic Province
cfs	cubic feet per second
CGS	California Geological Survey
CMWD	Casitas Municipal Water District
COPCO	California Oil Purification Company
CPO	Citizens to Preserve the Ojai

CREW	Concerned Resource and Environmental Workers
CUP	Conditional Use Permit
CUPA	Ventura County Certified Unified Program Agency
CUWCC	California Urban Water Conservation Council
cy	cubic yards
DFIRM	Digital Flood Insurance Rate Maps
DMM	Demand Management Measure
DOG	Design Oversight Group
DPS	distinct population segment
DSOD	California Division of the Safety of Dams
EHD	Ventura County Environmental Health Division
EIS	Environmental Impact Statement
EIR	Environmental Impact Report
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
eWRIMS	Electronic Water Rights Information Management System
FBVC	Farm Bureau of Ventura County
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FSSG	Fine Sediment Study Group
ft	feet
GAMA	California Groundwater Ambient Monitoring and Assessment
gpd	gallons per day
GSWC	Golden State Water Company
GWUDI	groundwater under the direct influence
HCP	Habitat Conservation Plan
HSI	Habitat Suitability Index
HLB	Huanglongbing
HSPF	Hydrological Simulation Program-Fortran
HUD	United States Housing and Urban Development Department

IPM	Integrated Pest Management
LCA	Land Conservation Act
LCRA	Lake Casitas Recreational Area
LIS	Locally Important Species
LOS	Level of Service
LPNF	Los Padres National Forest
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level
MDERP	Matilija Dam Ecosystem Restoration Project
mgd	million gallon per day
mg/L	milligrams per liter
mL	milliliter
MOU	Memorandum of Understanding
MOWD	Meiners Oaks Water District
MSL	Mean Sea Level
N	Nitrogen
N_2	Nitrogen Gas
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO_3	Nitrate
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRT	National Recreation Trail
NWI	National Wetlands Inventory
OBGMA	Ojai Basin Groundwater Management Agency
OES	Office of Emergency Services
OMP	Ojai Meadow Preserve
OS	Open Space
OVGC	Ojai Valley Green Coalition
OVLC	Ojai Valley Land Conservancy
OVSD	Ojai Valley Sanitary District
OWCD	Ojai Water Conservation District

OWTS	Onsite Wastewater Treatment Systems
P	Phosphorous
PBP	Priority Basin Project
PCBs	Polychlorinated Biphenyls
PDO	Pacific Decadal Oscillation
PSHB	polyphagous shot hole borer
PUC	California Public Utilities Commission
RCD	Resource Conservation District
RWQCB	Regional Water Quality Control Board
RWQCB – LA	Regional Water Quality Control Board – Los Angeles District
SBCK	Santa Barbara Channelkeeper
SCAG	Southern California Association of Governments
SCC	State Coastal Conservancy
SCS	Southern California Steelhead
SIA	Special Interest Area
SMCL	Secondary Maximum Contaminant Level
SMWC	Sisar Mutual Water Company
SOAR	Save Open Space and Agricultural Resources
SWAMP	Surface Water Ambient Monitoring Program
SWP	California State Water Project
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TAC	Technical Advisory Committee
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TRT	Technical Recovery Team
UCCE	University of California Cooperative Extension
USA	Upstream Storage Area
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation

USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	underground storage tanks
UWMP	urban water management plan
VCAILG	Ventura County Agricultural Irrigated Lands Group
VCEHD	Ventura County Environmental Health Division
VCGP	Ventura County General Plan
VCSQMP	Ventura Countywide Stormwater Quality Monitoring Program
CUPA	Ventura County Certified Unified Program Agency
VCWPD	Ventura County Watershed Protection District
VHC	Ventura Hillsides Conservancy
Vision Plan	Vision Plan for the Lower Ventura River Parkway
VLAFCO	Ventura Local Agency Formation Commission
VRP	Ventura River Preserve
VRWD	Ventura River Watershed District
WDR	Waste Discharge Requirement
WEAP	Water Efficiency and Allocation Program
WRCC	Western Regional Climate Center
WY	Water Year

4.2 Glossary

1% Annual Exceedance Probability Flood: A flood that has a 1 in 100 chance of being equaled or exceeded in any 1 year, and has an average recurrence interval of 100 years. 1% AEP is the current way of referring to what used to called a "100-year flood." AEP describes the probability of specific flood flows occurring, rather suggesting the length of time (years) between floods of specific flows.

50-year Flood: A flood whose flow has a 2%, of being exceeded in any given year. Has smaller peak flows than a 100-year flood.

100-Year Flood (also Base Flood): A flood whose flow has a 1% chance of being exceeded in any given year. A misleading term that does *not* mean a flood that will occur once every 100 years. The preferred term is currently "1% Annual Exceedance Probability Flood."

303(d) List: Section 303(d) of the Clean Water Act requires states to identify waters that do not meet water quality standards and to classify them by category. States must submit their lists to the USEPA for review and approval. These state-developed lists are known as Section 303(d) lists of impaired waterbodies (stream/river segments, lakes).

A

Acre-foot: The amount of water necessary to cover an acre (43,560 sq. feet) to a depth of one foot, or 43,560 cubic feet, which is equivalent to 325,828 gallons.

Adjudication: With regard to water rights, a legal decision that allocates water to parties in proceedings and is overseen by a court-appointed Watermaster.

Algae: A collective term for several taxonomic groups of primitive chlorophyll-bearing plants which are widely distributed in fresh and salt water and moist lands. This term includes the seaweeds, kelps, diatoms, pond scums, and stoneworts.

Alluvial: Pertaining to material or processes associated with transportation and/or deposition by running water.

Alluvial Deposits: Loose, unconsolidated sediments that have been transported by and deposited from running water.

Alluvial Fan: Cone-shaped fans of rock and sediment that have built up by stream deposition at the mouths of mountain and foothill canyons.

Alluvial Fan Flood: Flooding occurring on the surface of an alluvial fan or similar landform characterized by high-velocity flows; active processes of erosion, sediment transport, and deposition; and unpredictable flowpaths.

Alluvium: Soil, sand, gravel, and other material that has been transported and deposited by flowing water, as in a riverbed.

Anadromous: Pertaining to fish are born in fresh water, migrate to the ocean to grow into adults, and then return to fresh water to spawn.

Annual Exceedance Probability: The Annual Exceedance Probability (AEP) values indicate the chance that specific flood flows will occur in any one year. A 1% AEP means there is a 1 in 100 chance that a flood will occur in any one year.

Anticline: In structural geology, anticline refers to a fold, generally convex upward, in which each half of the fold dips away from the crest and whose core contains the older rocks.

Aquifer: Refers to subsurface deposits and geologic formations that are capable of yielding usable quantities of water to a well or spring, whereas a confining layer (or confining bed) refers to a low-permeability deposit or geologic formation that restricts the movement of groundwater. An aquifer can refer to a single geologic layer (or unit), a complete geologic formation, or groups of geologic formations.

Artesian: Pertaning to groundwater under sufficient hydrostatic pressure to rise above the aquifer containing it.

Atmospheric Deposition: Gases and particulates released to the atmosphere from combustion sources such as motor vehicle emissions, slash burning, and industrial sources, contain nitrogen, sulphur, and metal compounds, which eventually settle to the ground as dust or fall to the earth in rain and snow.

Average (or Mean): In statistics, the sum of all the numbers in a set divided by the number of numbers in the set.

B

Base Flow: The flow of water in streams that remains well after storms have passed. Also referred to as groundwater flow, or dry-weather flow.

Bed Load: Sediment particles resting on or near the channel bottom that are pushed or rolled along by the flow of water.

Bedrock: A general term for the solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Beneficial Uses: The resources, services, and qualities of aquatic systems that water quality regulations aim to preserve or improve. Beneficial uses include recreation; water supply; navigation; and the preservation and enhancement of fish, wildlife, and other aquatic resources. Beneficial uses can be existing, potential, or intermittent uses.

Benthic: Of, relating to, or occurring at the bottom of a body of water.

Best Management Practice (BMP): With regard to water quality, methods that have been determined to be the most effective, practical means of preventing or reducing pollution from non-point sources.

Biodiversity: Refers to the variety and variability among living organisms and the ecological complexes in which they occur. A measure of the variety of organisms present in ecosystems.

Blackwater: Household wastewater from toilets.

Braided Stream: A channel or stream with multiple channels that interweave as a result of repeated bifurcation and convergence of flow around inter-channel bars, resembling the strands of a complex braid. Braiding is generally confined to broad, shallow streams of low sinuosity, high bed load, non-cohesive bank material, and a steep gradient.

C

Channel: An open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of water. Natural channels may be single or braided.

Channelization: Artificial straightening, stabilizing, or diverting of stream channels, resulting in a straighter and deeper channel.

Coastline Armoring: The building of protection structures such as seawalls and riprap, intended to prevent coastal erosion.

Cobble: A rock fragment larger than a pebble and smaller than a boulder, rounded or otherwise abraded in the course of aqueous, eolian, or glacial transport.

Conductivity: Conductivity is a measure of the ability of water to pass an electrical current. Conductivity in water is affected by the presence of inorganic dissolved solids such as chloride, nitrate, sulfate, and phosphate anions (ions that carry a negative charge) or sodium, magnesium, calcium, iron, and aluminum cations (ions that carry a positive charge).

Confined Aquifer: An aquifer bounded above and below by impermeable beds, or by beds of distinctly lower permeability than that of the aquifer itself; an aquifer containing confined groundwater.

Confluence: The point where two streams meet.

Conglomerate: Consolidated (sedimentary) stone composed primarily of large, gravel-sized particles.

Critical Habitat: A specific area, identified by NOAA Fisheries and/or US Fish and Wildlife Service, in which are found physical or biological features essential to the conservation of an endangered or threatened species, and which may require special management considerations or protection. Multiple impacts are considered when designating critical habitat.

D

Debris Basins: A flood control feature in areas where streams carry high sediment loads. Debris basins are typically placed at canyon mouths, debris basins capture the sediment, gravel, boulders, and vegetation that are washed out of canyons during storms. The basins capture the material and allow the water to flow into downstream drainage channels.

Delta: The nearly flat alluvial tract of land at the mouth of a river, commonly forming a triangular or fan shaped plain resembling the Greek letter "delta." It is crossed by many distributaries, and results from the accumulation of sediment supplied by the river. Most deltas are partly above and below water.

Detention Basins: Engineered basins that temporarily store stormwater runoff, thereby reducing the peak rate of runoff to a stream or storm sewer. They help to prevent localized flooding and, if designed to do so, provide some water quality benefits and reduce streambank erosion downstream.

Discharge: In the context of water quality regulations, "discharge" means the release of waste to surface water or to the ground.

Distinct Population Segment (DPS): A population segment is considered distinct if it is discrete from and significant to the remainder of its species based on factors such as physical, behavioral, or genetic characteristics; or if it occupies an unusual or unique ecological setting; or if its loss would represent a significant gap in the species' range. A DPS is the smallest division of a taxonomic species that can be protected under the U.S. Endangered Species Act.

Distributary Channel: A channel that flows away from the main channel, characteristic of a delta.

Diversion: Control or removal of water from its natural course or location by ditch, pipe or other conduit.

E

Ecosystem: The interacting system of a biological community and its non-living environmental surroundings.

Effluent: An outward movement of water, as a stream from a lake or purified discharge from a wastewater treatment plant.

Electrofishing: A common fish population monitoring technique that uses electricity to stun fish before they are caught and counted.

El Nino/La Nina: El Niño is characterized by unusually warm ocean temperatures in the Equatorial Pacific, as opposed to La Niña, which characterized by unusually cold ocean temperatures in the Equatorial Pacific. El Niño is an oscillation of the ocean-atmosphere system in the tropical Pacific having important consequences for weather around the globe.

Endangered Species: Animals, birds, fish, plants, or other living organisms threatened with extinction by anthropogenic (man-caused) or other natural changes in their environment. Requirements for declaring a species endangered are contained in the Endangered Species Act.

Environmental Water: Defined by the state of California as "water serving environmental purposes, including instream fishery flow needs, wild and scenic river flows, water needs of fresh-water wetlands, and Bay-Delta requirements."

Ephemeral Stream: A stream that flows in direct response to and only during and shortly after precipitation events. Ephemeral streams may or may not have a well-defined channel. Their beds are always above the elevation of the water table, and stormwater runoff is their primary source of water. Ephemeral streams include normally dry arid or semi-arid region desert washes.

Erosion: The wearing away of the land surface by running water, waves, or moving ice and wind, or by such processes as mass wasting and corrosion (solution and other chemical processes).

Estuary: The widened tidal mouth of a river where fresh water comes into contact with sea water and where tidal effects are evident; e.g. a partially enclosed coastal body of water where the tide meets the current stream.

Eutrophication. The slow aging process during which a lake, estuary, or bay evolves into a bog or marsh and eventually disappears. During the later stages of eutrophication the water body is choked by abundant plant life due to higher levels of nutritive compounds such as nitrogen and phosphorus. Human activities can accelerate the process.

Eutrophic Conditions: Occur in a body of water that is highly productive of aquatic plants or algae due to the input of large quantities of nutrients.

Evapotranspiration: That portion of precipitation returned to the air through evaporation and plant transpiration.

Evolutionary Significant Unit (ESU): A population (or group of populations) which exhibits two biological characteristics: 1) it is substantially reproductively isolated from other conspecific (of the same taxonomic species) population units; and 2) it represents an important component of the evolutionary legacy of the species.

F

Fault: In geologic terms, a fracture or fracture zone along which there has been displacement of the sides relative to one another parallel to the fracture.

Fish Ladder: A series of small pools arranged in an ascending fashion to allow the migration of fish upstream past construction obstacles, such as dams. Also, an inclined trough which carries water from above to below a dam so that fish can easily swim upstream. There are various types, some with baffles to reduce the velocity of the water and some consisting of a series of boxes with water spilling down from one box to the next.

Flash Floods: Floods that occur very quickly after rain.

Flood or Flooding: A general and temporary condition of partial or complete inundation of normally dry land areas from:

l) The overflow of inland or tidal waters and/or

2) The unusual and rapid accumulation of runoff of surface waters from any source.

3) The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in this definition.

Floodplain: The area adjacent to a watercourse or other body of water that is naturally subject to recurring floods.

Floodplain Terrace: One, or a series of flat-topped landforms in a stream valley that flank and are parallel to the stream channel, originally formed by a previous stream level, and representing remnants of an abandoned flood plain, stream bed, or valley floor produced during a past state of fluvial erosion or deposition (i.e., currently very rarely or never flooded; inactive cut and fill and/or scour and fill processes). Remnants of constructional valley floors thickly mantled with alluvium are called alluvial terraces.

Floodway: The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot above the elevation of the water surface prior to encroachment into the floodplain.

Fluvial: Of or pertaining to rivers or streams; produced by stream or river action.

Fluvial Deposits: Sedimentary deposits produced by stream or river action.

Fry: Refers to fish in their first year of life (e.g., from spring emergence until the following spring).

G

Gaining Reach: A stream or reach of a stream whose flow is being increased by inflow of groundwater.

Geomorphic Province: Naturally defined geologic regions that display a distinct landscape or landform. Earth scientists recognize eleven provinces in California. Each region displays unique, defining features based on geology, faults, topographic relief and climate.

Geomorphology: The geographical study of the form of the earth. Geomorphic means of or pertaining to the shape of the earth or its topographic features.

Graywater: Water drained from household sinks, washing machines, tubs, and showers; that is, all water not coming from toilets. All household water except blackwater.

Groundwater Basin: An aquifer or system of aquifers that has reasonably well defined boundaries and more or less definite areas of recharge and discharge.

Groundwater Recharge: The movement, usually downward, of surface water or precipitation into subsurface soil and groundwater basins.

H

Habitat: The place where a population (e.g., human, animal, plant, microorganism) lives, along with its surroundings, both living and non-living.

Headwaters: The source of a river or stream.

Hydraulic Continuity: the interconnection between groundwater (aquifers) and surface water sources.

Hydrology: The properties, distribution, and circulation of water.

I

Impervious Surface (or Impermeable): A surface that does not allow the passage of water and thus potentially facilitates the generation of runoff.

Infiltration: The process by which water moves downward through the earth's surface, replenishing soil moisture and groundwater basins.

Influent: An inward movement of water, as a stream that flows into another stream or flows entering a wastewater treatment system.

Intermittent Stream: A stream that flows only at certain times of the year when it receives water from springs, groundwater, rainfall, or surface sources such as melting snow. Includes intermittently dry desert washes in arid or semi-arid regions.

L

Levee: An artificial embankment along a watercourse or an arm of the sea, to protect land from flooding.

Liquefaction: A process by which water-saturated sediment temporarily loses strength and acts as a fluid, like when you wiggle your toes in the wet sand near the water at the beach. This effect can be caused by earthquake shaking.

Littoral Cell: Discrete coastal regions that can be considered closed systems within which sediment is transported.

Littoral Current (or Transport): The movement of sedimentary material in the littoral zone by waves and currents. Includes movement parallel (longshore transport) and perpendicular (on-offshore transport) to the shore.

Littoral Zone: In beach terminology, an indefinite zone extending seaward from the shoreline to just beyond the breaker zone.

Longshore Current: An ocean current caused by the approach of waves to a coast at an angle. It flows parallel to and near to the shore.

Losing Reach: A stream or reach of a stream in which water flows from the stream bed into the ground.

M

Macroinvertebrate: An animal lacking a backbone that is generally visible to the unaided eye.

Maximum Contaminant Level (MCL): Enforceable drinking water quality standards.

Median: The mid-number in a set of numbers, such that half the numbers are above the median and half are below. To be distinguished from "average."

N

Nitrate: A compound containing nitrogen that can exist in the atmosphere or as a dissolved gas in water and which can have harmful effects on waterbodies, humans and animals. A plant nutrient and inorganic fertilizer.

Nitrogen: A colourless, odourless, tasteless gas that is the most plentiful element in Earth's atmosphere and is a constituent of all living matter.

Nonpoint Source: Nonpoint source pollution comes from a variety of diffuse sources: fertilizers, herbicides, and insecticides from agricultural and residential areas that do not drain to an MS4; oil, grease, and toxic chemicals from industrial and urbanized areas; sediment from improperly managed construction sites, crop and forest lands, eroding streambanks, and naturally occurring, erosive landscapes; salt from irrigation; bacteria and nutrients from horses, livestock, pet waste, and septic systems; atmospheric deposition; and stream channel modification.

NPDES Permit: As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

O

Orographic Lift: The forced rising of moist air up the slopes of hills and mountains.

P

Pathogen: Anything that can produce disease.

Peak Flow: The maximum instantaneous discharge of a stream or river at a given location.

Perennial Stream: A stream that flows continuously during a year of normal rainfall.

Point Source: Any discernible, confined, and discrete conveyance, (e.g., a pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft) from which pollutants are or may be discharged. This does not include agricultural stormwater discharges and return flows from irrigated agriculture, but does include discharges from municipal separate storm sewer systems (MS4s). (Clean Water Act, Section 502(14))

R

Reach: A continuous part of a stream between two specified points.

Redd: The nest constructed by trout or steelhead. Fertilized eggs are deposited in an excavated depression and covered by gravel.

Resident Rainbow Trout: *O. mykiss* that remain in freshwater throughout their life.

Riffle: Shallow water area with rapid current and with flow broken by a substrate of gravel or rubble.

Riparian Habitats: Water-dependent habitats adjacent to streams or other water bodies. Includes both wetland and upland zones.

River Terrace: Floodplain Terrace.

S

Safe Yield: In the context of water reservoirs, safe yield, or "firm yield" is defined as "...a quantity of water from a project or program that is projected to be available on a reliable basis, given a specified level of risk, during a critically dry period." (Public Law 108-361). In the context of groundwater basins, safe yield has commonly been defined as "the maximum quantity of water that can be continuously withdrawn from a groundwater basin without adverse effect" (CDWR 2003).

Scour: The powerful and concentrated clearing and digging action of flowing air, water, or ice, especially the downward erosion by stream water in sweeping away mud and silt on the outside curve of a bend, or during the time of a flood; a process.

Scour and Fill: A process of alternate excavation and refilling of a channel, as by a stream or the tides; especially such a process occurring in time of flood, when the discharge and velocity of an aggrading stream are suddenly increased, causing the digging of new channels that become filled with sediment when the flood subsides.

Secondary Maximum Contaminant Level (SMCL): Non-mandatory water quality standards related to esthetic factors, such as taste, staining, and color.

Sediment: Material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by water, wind, ice or mass-wasting and has come to rest on the earth's surface either above or below sea level.

Sedimentary Rocks: A layered rock resulting from the consolidation of sediment, e.g. a clastic rock such as sandstone, a chemical rock such as rock salt, or an organic rock such as coal. Some authors include pyroclastic rocks, such as tuff.

Sediment Load: The amount of sediment carried in a stream

Semi-Confined Aquifer: An aquifer that is partially confined and partially unconfined.

Septic Tank Leachate: The liquid that remains after wastewater drains through septic solids.

Shale: A fine-grained detrital sedimentary rock, formed by the compaction of clay, silt, or mud. It has a finely laminated structure, which gives it a fissility along which the rock splits readily, especially on weathered surfaces. Shale is well indurated, but not as hard as argillite or slate. It may be red, brown, black or gray.

Sheet Erosion: The removal of thin layers of surface material more or less evenly from an extensive area of gently sloping land, by broad continuous sheets of running water rather than by streams; rain wash.

Smolt: Juvenile *O. mykiss* that is physiologically adapted to seawater and emigrates to the ocean.

Spawning. The depositing and fertilizing of eggs (or roe) by fish and other aquatic life.

Steelhead: *O. mykiss* that rears to maturity in the ocean before entering freshwater to spawn.

Stormwater Runoff: Rainfall or snowmelt that runs off over the land surface, potentially carrying pollutants to streams, lakes, or reservoirs.

Subwatershed: A smaller watershed that is part of a larger watershed.

Surface Water: All water naturally open to the atmosphere (rivers, lakes, reservoirs, ponds, streams, impoundments, seas, estuaries, etc.).

Suspended Load: The part of the total stream load that is carried for a considerably period of time in suspension, free from contact with the stream bed; it consists mainly of clay, silt, and sand.

T

Take: Defined in the Endangered Species Act as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species. Incidental take permits authorize the incidental take (i.e., take that occurs incidentally during an otherwise lawful activity) of a listed species, such as steelhead.

Tertiary: The first period of the Cenozoic era thought to have covered the span of time between 65 million and 2 million years ago.

Total Dissolved Solids: The total amount of mobile charged ions, including minerals, salts or metals dissolved in a given volume of water, expressed in units of mg per unit volume of water (mg/L), also referred to as parts per million (ppm).

Total Maximum Daily Load (TMDL): A regulatory term in the federal Clean Water Act describing the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.

Tributary: Any stream that contributes water to another stream.

Turbidity: Cloudiness or muddiness of water or ocean, resulting from suspended or stirred up particles.

U

Unconfined Aquifer: Groundwater that has a free water table, i.e. is not confined under pressure beneath relatively impermeable rocks.

Unconsolidated: Soil material that is in a loosely aggregated form.

Unincorporated Area: Land area that is outside of city limits and in the jurisdiction of the county.

W

Wastewater: Includes any combination of water, soap, food scraps, and human excrement that is flushed down toilets, sinks, and shower drains. Wastewater can contain a wide variety of constituents known to affect water quality, including pathogens, bacteria, nutrients, pharmaceuticals, perfumes, and toxic chemicals. Wastewater includes both "blackwater" (wastewater from toilets) and "graywater" (all used household water except blackwater).

Water Quality Objectives: Defined by the Water Code as "the allowable limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area." (RWQCB-LA 1994)

Watershed: A geographic region within which water drains into a particular river, stream, or other waterbody. Also called catchment, drainage, or basin. Every area of land is part of a watershed, each one separated from the next by the ridges between elevation peaks. There are complex interrelationships among the streams, aquifers, lakes, habitats, people and economies that make up a watershed system, such that changes or impacts to one part of a watershed can ripple through and affect other parts.

Water Table: The top of the saturated zone of a groundwater basin, the level below which the ground is saturated with water.

Water Year: A "water year" or "rain year" is defined as October 1 of the previous year through September 30. For example water year 2003 is from October 1, 2002, through September 30, 2003.

Wetland: Lands transitional between obviously upland and aquatic environments.

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4.4 Appendices

Appendix 4.4.1 Plan Public Scoping Meeting Summary, October 3, 2012

A Public Scoping Meeting to discuss and obtain input for development of the Ventura River Watershed Management Plan was held at the Oak View Community Room, Oak View on the evening of October 3. A total of 60 people showed up for the meeting, which was a good turnout since it was held on the same night as the first Presidential debate. For 28 of the people in attendance, this was their first Watershed Council meeting.

After a brief overview presentation and introductions, participants had the opportunity to write on a card their "biggest concern" and their "best idea" with regard to the watershed. These cards were collected and then read aloud so we could all hear each other's concerns and ideas.

The group then had a discussion on a variety of watershed topics including groundwater concerns, the cost/hassle/time of permits to clear channels and remove Arundo, the need for education, Matilija Dam, steelhead, the need to affect policy, pesticides, the cost-effectiveness of schemes to enhance our water supplies, the threat of fires, economic considerations, graywater, the need to balance the demands on our limited water, and more.

After hearing the written and spoken ideas of others, participants had an opportunity to fill out another card summarizing what they believe to be the five biggest concerns and five best ideas, as well as any questions they had.

The "biggest concerns" and "best ideas" are summarized below. Many good ideas were received. The ideas have been organized by the seven watershed management plan goal categories, and further organized by the type of project or program. Many of the ideas straddle categories, and sometimes ideas are included in more than one category. Sometimes the ideas weren't stated clearly enough to be certain of the intent of the author, so some assumptions had to be made. (These factors also make it impossible to do any kind of fair statistical summary.)

The concerns/ideas statements speak for themselves. But there was one theme that came across very strongly in the discussion that is not quite as emphasized in the statements, and that is how frustrated stakeholders are with regulations and permit requirements that effectively prevent them from taking beneficial actions, such as keeping drainage channels cleared so they don't clog in storms. Related to this is the number of permits required to do any work and lack of an integrated permitting process. There were statements about it taking over a year to get permits

to work in streams, or of one required permit expiring before all the other permits were issued. The prohibitive cost of permits was part of this discussion.

Attendees provided lots of positive feedback about the meeting and the process.

4.4.1.1 Best Ideas

Sufficient Water Supply/Balancing Supply with Competing Demands

Educate/Motivate

- Incentives for residential and commercial use of native plants and water conservation.
- Encourage use of drought resistant plants - less grass/thirsty plants.
- Promote alternative water sources i.e., water conservation, greywater, infiltration, recycled water.
- Conservation education plan that individuals can implement on their own land, e.g. ocean friendly gardens, rainwater capture, etc.
- Settlement/recharge/infiltration incentives.
- Promote infiltration of stormwater.
- Provide incentives for water conservation.
- Provide homeowner landscaping workshops and rain gardens/River Friendly Gardens.
- Ag water use – look at water and importance to meet needs of local/regional food demands, including efficient irrigation, crop selection workshops.
- Reduce demands.
- More education on how to stop using potable drinking water for large lawns, capture rainwater to put into the landscape. Collectively manage our shared resources.
- Make everyone understand what comes out of sewer plant - clean water. No chemicals used.
- Education of water conservation.
- Make everyone aware we have a limited supply.

Study

- Hydrogeological study of the watershed.

Amend or Enforce Policies and Regulations/Involve Regulators

- Eliminate requirement of landscaped parkway in residential neighborhoods.
- Groundwater recharge - can we change paving protocols in cities and the County?
- Consumption use restrictions for landowners using groundwater and surface water and water district that are adequate to maintain adequate water for ecosystem, farmers, wildlife use (including fisheries).
- Require ag to harvest and contain rain water and contour land with swales to increase onsite water storage.

Improve Infrastructure

- Capture storm flow via off-stream diversion ponds. If a simple weir gate were installed adjacent to the stream channel that could be overtopped by higher than normal flows, and closed when needed, then some portion of a flood flow could be captured for groundwater recharge. Accumulated sediments could be collected and used.
- Store tertiary treated wastewater in the winter to be released in dry weather.
- Contour ditches to slow it, sink it and store it.
- Groundwater recharge - I liked the idea of 100s of small projects - Is agricultural acreage useful for groundwater recharges?
- Aquifer recharge basin.
- Make groundwater recharge the best it can be in all Ventura River groundwater basins.
- Settlement/recharge/infiltration projects.
- Enhance groundwater recharge in Ojai Basin via Ojai Basin Groundwater Management Agency (OBGMA).
- Increase/optimize water storage in the watershed.
- Drill a horizontal well into Matilija dam.
- Removal of Matilija Dam - I think that it should be reconfigured as an above ground aquifer and be studied as such.
- Increase catching and holding water on our land.
- Create a 'Watershed Corps' to build 100,000 small $1,000 projects to retrofit urban and agricultural lands to enhance water supplies and water quality and reduce flooding.
- Look at ways to expand the use of recycled water to reduce demands.

Plan/Collaborate Regionally

- Water management plan including groundwater management plan.
- Develop Groundwater Management Plan for main stem of Ventura River for diverters/pumpers (AG, Casitas, Water Companies, Ecology & Habitat).
- Set up a Joint Powers Authority for diverters/groundwater pumpers in main stem of Ventura River.
- Revise OBGMA with change in Golden State Water.
- Improve local cooperation and set our own allocations by forming a Water Users Association (Club) of pumpers/diverters in the Ventura River (Main stem) - include representation by water districts, City of Ventura, agriculture, and habitat. The Club can work on its own solution to a groundwater management plan (GWMP) and would be the local entity to deal with the Regional Board.

Improve Management Methods

- Reuse potable water, store in winter, create "swales" in agricultural land.
- Enhance rainwater capture opportunities.
- Control of invasives out of watercourse to increase water supply.
- Clear weeds, willows, and Arundo from all channels leading to better percolation into groundwater.

Healthy Ecosystem

Restore Habitat & Ecosystem Services

- Matilija dam removal.
- Remove Matilija dam ASAP.
- Take the dam down. Figure out how to make it happen.
- Notch it! (Matilija Dam).
- Matilija Dam removal.
- Removing the Matilija Dam.
- Focus on a reasonable incremental and economically feasible plan to remove the Matilija Dam.
- Assist fish passage conditions by maintaining selected pools.
- Increase native plants and natural functions in creeks and river, reach by reach.
- Remove invasive species/restore native habitats.
- Invasive species eradication projects.
- Grants to remove Arundo from watershed.
- Fund Crew more for Arundo removal.

- Use goats to eat Arundo and other invasive plant species. Prepare study to cover potential impact from goat waste vs. use of pesticides. Plant identification training to goat handlers to avoid goats ingesting native species.
- Improve ecosystem.
- Restoring the Ventura River - the lower portion.

Acquire Land & Easements

- Work with Ojai Valley Land Conservancy to obtain and maintain the best examples of ecosystems to be preserved for the public use for passive recreation while preserving habitat value.

Plan/Collaborate Regionally

- Remove ability for homeless to illegally live in the riverbed. Remove Arundo removes the ability to build Arundo structures that give privacy. Also getting public eyes through parkway public access, also make river less desirable for illegal encampments.
- Better alternatives for the homeless.
- Find the Homeless a better place than the river bottom.

Improve Management Methods

- Transition to organic methods for healthy ecosystems. Funding available through NRCS to transition.
- Transition to organics in agriculture and landscaping/gardening. Discontinue use of Roundup on Arundo and other so-called non-natives. Use of manual labor in mechanical techniques.

Coordinated Watershed Planning & Education

- Continue and expand on work of Council.
- Continue developing multi-benefit, integrated projects with multiple collaborators.
- Keep a watershed coordinator in place to keep process moving forward.
- Establish a long-term watershed coordinator position.
- Ensure that Council membership includes all stakeholders affected by watershed plans.
- Be proactive with Ventura River solutions.
- Integrated water management on multiple scales.
- Merge the many water providers/ districts into a Joint Agency to better coordinate and manage both groundwater and recreation –to avoid duplication of effort and improve parkway and river access

and recreation programs with land conservancies, cities and County of Ventura.

- Include CERT, Cities, County, US Forest Service, water providers in planning and prep.
- Distribute plan to stakeholders/water providers.
- Organize watershed agencies and stakeholders.
- Coordinate emergency preparedness and response for flood, earthquake and fire.
- Self-regulating community groups.
- Maintain a balanced approached to water management. Be realistic about how things have changed in the last 100 years.
- The group should focus on what is right in the watershed and not be lead by unreasonable, new regulations.
- There needs to be an open space or vegetation management plan within the overall plan.

Watershed Education

- Watershed education programs in schools and churches.
- Watershed signage.
- Increase education/outreach regarding watershed issues.
- Environmental center/education program for kids and adults.
- Implement Ocean Friendly Gardens water conservation methods - native planting, greywater use.
- Educate on local hydrology. How does Ventura River act?
- Signs leading to the existing bike path and river access.
- Integrate watershed education and student involvement into the schools within the watershed.
- Keep community informed and upcoming requirements.
- Promote understanding of historical watershed management planning/progress to date.
- Watershed education in community schools and for adults thru Watershed U workshops.
- Watershed, river and creek signage.
- Support for developing Ventura River Parkways/Nature Center/ OVLC Watershed Ed Steelhead Preserve.
- Education and outreach.
- Education & outreach to public about water use and watershed.

- Watershed, river and creek signage and educating the religious community.
- Have Council reach out to local chambers of commerce and/ or civic groups such as Rotary, Optimists and make educational presentations.
- The general public and especially children need to be educated about the watershed and invited to experience it and participate in its preservation.
- Get everyone involved/engaged in long-term protection to assure success.
- Massive education for alternatives to pesticides, xeriscaping, saving water-seriously. Use of compost toilets-we poop in pure, beautiful water (that's nuts). Local laws passed to make all this mandatory.
- Increase public awareness of the challenges and delights of our watershed.
- Education and outreach to public about water use and watershed.

Amend or Enforce Policies and Regulations/Involve Regulators

- Coordinate/reduce permit requirements.
- Develop a watershed plan that will be incorporated into County and Cities' planning documents as a guide to keep all parties working toward identified goals. Incorporate Ventura River Parkway Plan into the Watershed Plan.

Develop Funding

- Find creative funding mechanisms to finance projects.
- Seek grant funding to support our efforts.

Land and Resource Management

Educate/Motivate

- Promote better ranch land and water evaluation/ land management techniques.

Amend or Enforce Policies and Regulations/Involve Regulators

- Work with local government to make changes that promote the goals of the watershed. Smart land use and resources.
- Get resource and regulatory agencies more involved and updated on our efforts.

Improve Management Methods

- Sustainable Agriculture: Best practices; reduce use of pesticides; continue/expand water conservation efforts; eliminate runoff.

Plan and Collaborate Regionally

- Transition plan for agriculture [if ag dies out in watershed].
- Bring in the Ventura County Fire Department to be an active partner in vegetation management.

Support Local Economies

- Create local jobs fixing problems.
- Include economically reasonable solutions. Human use of water is important - especially agriculture.
- Develop economic model to redirect resources.
- Need to integrate economics of the community into watershed plans, e.g. impacts on development, employment. Ability of Council to incorporate all relevant components, e.g. no reference to this in your plan.

Flood Management

- Address flood risks to protect life and property.

Acquire Land & Easements

- Preservation of floodplains for more natural flood protection.
- Preservation of floodplain areas along major watercourses.

Amend or Enforce Policies and Regulations/Involve Regulators

- Bring DFG into flood control issues - their permitting process is really dangerous. Can they be changed?
- Inappropriate building in floodplain: County and cities refuse to permit building in dangerous and inappropriate locations which impact the river and cost taxpayer money to recover from flooding disaster.
- Don't allow development in the floodplain.
- Clean out streambed/back to its original depth of 15' below river crossing. What can be done regarding property owners (next to stream) who illegally store commercial equipment and debris from their business, which creates potential for damming the creek and causing flood problems for other residences? How can we get a grant for a bridge across the Camp Chaffee Road and Coyote Creek bed graded down to a level that will protect the people adjacent to the creek from flooding?

Improve Infrastructure

- Survey existing drainage structures and watershed to improve/replace/upgrade or install new structures.
- Create a 'Watershed Corps' to build 100,000 small $1,000 projects to retrofit urban and agricultural lands to enhance water supplies and water quality and reduce flooding.
- Study watershed and identify inadequate structures/repair and replace.

Clean Water

Educate/Motivate

- Promote infiltration of stormwater.
- Teach all to clean up (after) their own pet.

Study

- Identify pollution sources; develop local programs to reduce pollution.
- Study of sources of nitrogen and input to river.
- Study of pesticides and herbicides within watershed.

Improve Management Methods

- Safer water sanitizing methods.
- Questions - driven data collection. Make water testing a community resource.
- Survey waterways for trash and cleanup. May require volunteers or/and grants.
- Reduce pollution to rivers & streams.

Improve Infrastructure

- Use bio-digester or composting program for use of green waste/manures.
- Water Quality: expand use of bioswales to capture runoff and allow it to percolate.
- Create a 'Watershed Corps' to build 100,000 small $1,000 projects to retrofit urban and agricultural lands to enhance water supplies and water quality and reduce flooding.
- Presently working on a system to clean up the rivers, the air and the land. The most effective being the biodigester to convert organic wastes into energy, fertilizer and compost.

Amend or Enforce Policies and Regulations/Involve Regulators

- Ban Roundup use on lawns etc.
- Encourage work with existing regulatory agencies to do better enforcement on land use issues that result in pollution with the watershed.
- Work for practical TMDLs for trash and nutrients, and help with implementation.

Access to Nature

- Enhance access and recreation through River Parkway.
- Coordinate public recreation and outreach events.
- Provide more public access to river area.
- Encouraging recreational use of the watershed.

Amend or Enforce Policies and Regulations/Involve Regulators

- Implement/incorporate Ventura River Parkway Plan into watershed planning; adopt into all local plans.

Develop Funding/Support Local Economies

- Use implementation of Ventura River Parkway to get funding for improvements (recreational, environmental and infrastructure upgrades). Parkway is an umbrella project across many jurisdictions.

Improve Infrastructure

- Improve trails and provide access to river for schools/classroom learning.
- A walking/nature trail along San Antonio Creek.

4.4.1.2 Biggest Concerns

Sufficient Water Supply/Balancing Supply with Competing Demands

- Lack of water for all users.
- Water conservation
- Is there enough water - will there continue to be?
- Balancing water supply with demand. Sustaining water levels with the pressures on the watershed.
- Given our watershed is finite, I'm concerned about the expansion I see of citrus groves and other agriculture. The river is depleted significantly when irrigation occurs.

- Environmental goals will take priority over the needs of the 42,500 people and 6,000 acres of agriculture.
- Balancing variable water supply with demands for healthy ecosystem.
- Water conservation! What is our supply what we have left?
- Water use and supply for both people and wildlife.
- Forced water right allocations in the main system of the Ventura River by outside agencies.
- Lack of water.
- Water from Ventura Watershed being used outside of Casitas District.
- Making sure there is water enough for people, business, farmers, and the Ventura River habitat.
- Sufficient water supply to meet the conflicting demands in our watershed.
- Protecting water supply for ecosystems and people.
- Water supply
- Balancing needs of all water users during a drought.
- Overuse of our water supply.
- Supplying water to coastal area that has no watershed into Ventura River.
- Water use and supply for people and wildlife.
- Education and outreach.
- Water conservation.
- Maintain independence from state water - self sufficient.
- Water supply.
- Balancing environment with human demands.
- Maintaining our independence from State water.
- Water conservation.
- Water supply; reuse; greywater.
- Loss of Ojai aquifer and the drought.
- Drought
- Drought
- Drought
- Adequate water supply for environment and people
- Water supply - threats and opportunities.
- Waste of water.

- [Need to] balance variable water supply with water demands for ecology, AG, people
- That we bicker our future away and don't take local action on planning water allocations in the main stem of the Ventura River. Forced water rights or allocations from State/Federal Agencies mean loss of local control and will surely bring lawsuits and neighbor against neighbor feuds.

Clean Water/Toxicity

- Pesticides/herbicides in the water.
- Protecting water quality for ecosystems and people.
- Water quality.
- Chemical trails, toxic waste & pesticides going into Ventura River.
- Animal waste (from ranches & stables) going into Ventura River.
- Poor or unknown water quality in the estuary.
- Nitrogen inputs to watershed.
- Pesticide/herbicide use.
- Equestrian facilities and horse waste in the watershed.
- Water quality - good data needed, water quality important, needs to be programmed on good data.
- Septic tank system infiltration.
- Pesticides/herbicides use and effect on children and the whole ecosystem.
- Chloramines and other chemicals added to water supply.
- Water quality, reducing runoff.
- TMDL control
- Roundup??
- Health of water basin recharge source - San Antonio Creek, Reeves Creek, Thatcher Creek, etc.
- Improve river water quality
- Better control needed of land use that results in contaminates entering surface and groundwater.
- Maintaining water quality.
- Trash within watershed is waterways/channels/creeks (including asphalt or appliances).
- Pollution and poisoning of our water and land by pesticides used by big ag, County, Land Conservancy, etc. Also toxic chemicals from oil industry and other industries.

Flood Management

- Coyote Creek.
- Flood control
- Flood protection - levee certification of existing levees with FEMA.
- Deteriorating infrastructure (drainage).
- Clearance of streams - *why doesn't watershed protection do this? Look at Thatcher Creeks and Reeves Creek - where will the flood water go?*
- Difficulty clearing streams of obstructive plants and trees that create flooding hazards.
- Addressing floods.
- Inappropriate building in floodplain.
- Failure of upstream property owners to maintain stream channels create downstream flood problems.
- Keeping development (which restricts river function) out of the flood plain.
- Aging infrastructure (drainage - not sure about supply) - limit property loss and flooding.

Permits/Regulations are Excessive, Ineffective, Expensive or Create Hazards

- Difficulty in getting permits to clear weed and debris from drainage systems for private property owners.
- That regulations being crafted by the Regional Water Board will cause irreparable harm to agricultural producers in the watershed for unknown and/or limited environmental gain.
- More government regulation - such as meters.
- Regulatory issues.
- MS4 regulations.
- Difficulty that private property owners have in getting numerous permits to manage drainage channels.
- Regulations are written that are unachievable.
- Monitoring costs are high with new regulations and are not flexible enough.
- This watershed is in good shape and yet it is facing extreme regulations.
- Regulatory involvement - too much may hurt property use/values.

Healthy Ecosystems

- Arundo and invasive species abatement.
- Control of invasive species such as Arundo.
- Keeping Arundo/invasive species out of river (healthy ecosystems).
- I'd like to get the damn dam gone.
- Stop study of Matilija Dam and get it out of there.
- Removal of Matilija Dam.
- Matilija Dam.
- Pesticides/herbicides use and effect on children and the whole ecosystem.
- Environmental quality - maintain or improve habitat/water quality.
- Improving river and riverside ecosystems.
- Provision of adequate surface water to preserve, maintain and enhance wildlife value.

Climate Change

- Watershed resilience to climate change.

Land and Resource Management

Need to Manage/Protect our Watershed's Character

- Preserving the Valley for the benefit of all residents, people, livestock and wild animals.
- General preservation of watershed values into the future.
- Maintaining beauty and natural character and habitat/environment in watershed.
- Preserving existing character of the watershed.
- General preservation of watershed values (e.g. ecosystems etc.).
- Watershed resilience to population growth.

Need to Keep our Agricultural Industry Viable

- Ag viability.
- Agriculture is getting a bad rap in the area when it is not deserved.
- Agricultural viability and preservation.
- Value of agriculture (citrus and grazing).
- Sustainable agriculture in the watershed; awareness that other uses may not be as desirable; continue/improve best practices.
- Agriculture dies out in the watershed.

- The goals of the watershed do not adequately represent a vital economy or support agriculture.
- There seems to be an illogical fear of the safe use of pesticides in agriculture.

Need to Address Economic Issues

- Economics of various solutions.
- Lack of funding to implement good ideas/projects.
- Funding - misallocation to ineffective projects results in lack of funding for solutions.

Access to the River/Recreation

- Recreational access to the Ventura River.
- Recreational access.
- Public access to river.
- Recreational access to river, habitat restoration.
- Public access to river for recreation and education.

Coordinated Watershed Planning & Education

- Growing polarization of stakeholders e.g. agriculture/land owners and environmental groups.
- Water management.
- Getting diverse interests to work together - farmers, residents, city government, industry.
- Coordination between agencies, Ag. And environmental groups to actually accomplish good things.
- The urgent takes priority over the important.
- Conflicted objectives
- Organization of watershed agencies, stakeholders

Watershed Literacy

- Watershed literacy.
- Potential lack of interest on the part of residents and others living/working in watershed.
- Addressing fires.
- Ignorance and selfishness will stifle progress.

4.4.1.3 Questions

- Have other area or state watershed plans successfully completed groundwater management plans?
- Are there any lessons we can learn from work done in the other Ventura County watersheds that will help us with the Ventura River Watershed Plan?
- From listening here: How can we simplify permitting for constructive, habitat improvement work in the watershed?
- Have we identified a list of best funding sources to assist in achieving projects which will be part of the watershed plan?
- When will the plan be completed?
- What is the impact of the marijuana growers in the Los Padres? The effects on water supply and quantity?
- How are Council members appointed or elected?
- What is the projection for population growth in the Ventura River Watershed?

4.4.1.4 Public Scoping Meeting Outreach

Notice of the Public Scoping Meeting was conducted through a number of methods, including the following:

- Email meeting notices to Watershed Council participants (275)
- Email meeting notices to Watershed U participants (55)
- Letters to residents/landowners (330) with property near the Ventura River and tributaries
- Email messages to Ojai Valley Land Conservancy members (1500)
- Email messages from other groups including Friends of the Ventura River, Ojai Valley Green Coalition and Association of Water Agencies, Ventura County
- Paper announcements in Ojai Valley News, Ventura Reporter and Ventura County Star
- On-line announcements in Ojai Valley News, Ventura County Star
- Radio announcement on KCLU News

Appendix 4.4.2 Tier 1S and Tier2 Projects and Programs

The Watershed Council's Master Archive of Projects and Programs is divided into two tiers: Tier 1 and Tier 2.

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.

Tier 1 projects are further divided as to whether the project has a project lead (Tier 1L) or a project 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. A supporter is an organization willing to actively advance a project/program, but that is not in a position to be the lead. Tier 1L projects and programs are listed in "2.4.2 Priority 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.

Tier 1S and Tier 2 projects and programs are listed in the tables on the following pages.

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.

Table 4.4.1.1 Tier 1S Priority Projects and Programs

ID#	Tier 1S Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	Improve/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
	Goal 1: Sufficient Local Water Supplies						
2	**Upper Ventura River Basin Groundwater Management Group/ Organization/JPA.** Form a group, organization, cooperative, club or joint powers authority to facilitate communication and collaborative management of the basin's water supply and quality.					x	S: RWQCB
4	**Water Supply and Demand Budget and Safe Yield Study.** Develop a water budget and safe yield estimate for the watershed. (IWPP)	x					S: Surfrider
10	**River Storm Flow Capture and Storage Analysis.** Investigate opportunities/options to harvest more storm flows, such as in stream/river adjacent storage ponds.	x					S: Ventura Water
13	**Satellite Wastewater Treatment Analysis.** Investigate the feasibility/ benefits of installing more satellite wastewater treatment plants to increase options for water reclamation/recharge (such as for Lake Casitas toilets). (Per state policy, recycled water cannot be used until a Salt and Nutrient Management Plan is completed.)	x					S: OVSD
21	**Integrated Water Supply Management Modeling.** Use the WEAP (Water Evaluation and Planning) model, or other appropriate modeling tools, to develop management strategies that maximize efficient use of the watershed's water supplies through integration of water supply, water demand, water quality and ecological considerations.	x					S: Ventura Water
30	**Rincon Evapotranspiration Station.** Improve irrigation efficiency in the Rincon area by installing an evapotranspiration weather station.	x					S: Casitas
33	**Water Waste Reporting Tool.** Work with water purveyors to develop a water waste hotline, bulletin board, phone application or other tool to help catch and stop water waste.	x					S: WPD
	Goal 2: Clean Water						
40	**Septic to Sewer Conversion.** Convert septic to sewers in problem areas, including areas of high groundwater areas (e.g., Arbolada, Siete Robles).					x	S: RWQCB, OVSD
44	**Biodigesters.** Build biodigesters for manure management and the creation of bioenergy.		x				S: RWQCB, RCD, OVGC
47	**Local Water Quality Testing Laboratory Feasibility Analysis.** Investigate the feasibility of expanding an existing laboratory to serve some of the watershed's water quality testing needs in order to lower costs.	x					S: OVSD
50	**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 the data.	x					S: WPD, OVSD

Table 4.4.1.1 Tier 1S Priority Projects and Programs *(continued)*

ID#	Tier 1S Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	Improve/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
69	**Animal-Keeping Policies Update.** Review Ventura County's animal-keeping regulations (e.g., zoning, waste management plan requirements) to determine if improvements can be made to better address animal/livestock density, location and waste management issues.				x		S: SBCK
71	**Green Streets Committees.** Establish Green Streets Committees in the watershed's three jurisdictions where roads, stormwater, and flood control staff would collaborate on the design of capital improvement and development projects that involve streets, sidewalks or parking lots in order to best integrate stormwater infiltration features and to maximize the flood control-related economic benefits of infiltration.					x	S: SBCK, Surfrider
	Goal 4: Healthy Ecosystems						
122	**Permit Streamlining - Invasives Removal.** Investigate/ implement strategies to reduce the cost/burden of *Arundo*/invasives removal permits, such as clustering projects into one permit.				x		S: OVLC
123	**Invasive Plants Education Program.** Develop/implement an invasive plant species education program.			x			S: Ojai
131	**Streamside Property Owners Stewardship Program.** Develop/maintain an outreach/education program targeting riparian landowners that addresses invasive plant removal, habitat restoration, steelhead habitat protection, permeable surfaces, stormwater retention, flooding awareness and preparation, livestock BMPs, etc. Address challenges related to required permits for streamside activities.			x			S: RWQCB, RCD
136	**San Antonio Creek Restoration at Rancho Dos Rios.** Restore this stretch of creek, an important location for steelhead, by stabilizing the bank, reestablishing riparian vegetation, improving in-stream salmonid habit, and protecting the existing bridge and private access road from scour.		x				S: Landowner
137	**Estuary Restoration Plan.** Develop an estuary restoration plan; include enhancement of the second river mouth.	x					S: Coastal Cons.
	Goal 6: Responsible Land and Resource Management						
152	**Watershed Corps.** Fund, through a jobs programs, the installation of 10,000, small-scale (~$1,000) projects to retrofit urban and ag lands to enhance water conservation/ capture/quality and flood mgmt.		x				S: Friends
153	**Wildfire Risk Assessment and Fuels Management Plan.** Work with Fire Safe Councils (state and local), fire departments (including those adjacent to the watershed), USFS, BLM and local experts to develop a strategic, watershed-specific fuels management plan that identifies/ prioritizes locations that pose greatest wildfire risk and develops/prioritizes actions to help prevent catastrophic wildfires. Investigate whether groundwater recharge shows a positive response to fuel reduction.	x					S: Ojai

Table 4.4.1.1 Tier 1S Priority Projects and Programs *(continued)*

ID#	Tier 1S Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	Improve/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
158	**Outreach to Elected Officials.** Offer educational presentations to elected bodies (e.g., city councils, Board of Supervisors, water districts) about the watershed management plan, accomplishments and concerns.			x			S: Coastal Cons.
160	**Alternative Energy Use Study - Ag.** Investigate the use of alternative energy sources as a viable means to help meet the needs of the agricultural community.	x					S: OVGC
161	**Alternative Energy Use Study - Water Delivery and Treatment.** Investigate the use of alternative energy sources as a viable means to help meet the energy needs of the water and wastewater purveyors.	x					S: Casitas, OVSD, OVGC
162	**Wildfire Prevention Education.** Ambitiously support efforts to increase public awareness of the consequences of catastrophic wildfires and thus the need for fuels management.			x			S: Ojai
166	**Better Regulation Enforcement - Water Quality.** Improve enforcement of existing regulations related to water quality (e.g., animal keeping, septic systems, littering).				x		S: RWQCB
	Ventura Water—City of Ventura's Water Division						
176	**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).			x			S: Ventura Water

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

1S = A Tier 1 project or program which has a "supporter"—an entity or organization willing to actively advance a project/program, but that is not in a position to be the lead.

Abbreviations:

Casitas—Casitas Municipal Water District
Coastal Cons.—California Coastal Conservancy
County Planning—Ventura County Planning Division
Friends—Friends of Ventura River
Ojai—City of Ojai
OVGC—Ojai Valley Green Coalition
OVLC—Ojai Valley Land Conservancy
OVSD—Ojai Valley Sanitary District
RCD—Ventura County Resource Conservation District
RWQCB—California Regional Water Quality Control Board – Los Angeles District
SBCK—Santa Barbara Channelkeeper
Surfrider—Ventura Chapter of the Surfrider Foundation
WPD—Ventura County Watershed Protection District
Ventura—City of Ventura
Ventura Water—City of Ventura's Water Division

Table 4.4.1.2 Tier 2 Priority Projects and Programs

ID#	Tier 2 Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	Improve/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
	Goal 1: Sufficient Local Water Supplies						
3	**Upper Ventura River Basin Groundwater Management Plan.** Develop a management plan that develops better maps and models of the groundwater basins and recharge areas; compiles better well and groundwater data for the basins, including data on existing wells (whether they are active, permitted, metered), current and historical groundwater pumping rates, and locations of potential new wells; and recommends basin management priorities.	x					
6	**High Efficiency Equipment Installations.** Install or retrofit, at new and existing homes, buildings, landscapes and farms, state-of-the-art high efficiency water using equipment systems and technologies.		x				
9	**Groundwater Rights Transfers/Purchases/Leases Analysis.** Identify value of/opportunities for transfers/purchases/ leases to modify where, how and when groundwater is used. (like Walla Walla)	x					
20	**Salt and Nutrient Management Plan.** Develop a Salt and Nutrient Management Plan, as required by the state's Recycled Water Policy, so that it is in place if recycled water use is pursued in the watershed.	x					S: RWQCB
24	**Rincon Desalination Facility.** Build a small seawater desalination facility in the Rincon area to improve drought resiliency and improve the Rincon area's water supply reliability. This water would be more likely to be available for drought contingency than State water.		x				S: Ventura
28	**Monitor Water Issues Wherever Watershed Water is Used.** Ventura River watershed water is used outside the physical boundaries of the watershed - in the city of Ventura and in the Rincon area. Track changes in water policy, programs and use in these areas; support efforts to improve water-use efficiency.					x	
32	**Lower Ventura River Basin Groundwater Management Plan.** Develop a management plan that develops better maps and models of the groundwater basins and recharge areas; compiles better well and groundwater data for the basins, including data on existing wells (whether they are active, permitted, metered), current and historical groundwater pumping rates, and locations of potential new wells; and recommends basin management priorities.	x					
38	**Groundwater Extraction Estimates - Upper/Lower Ventura River Basin and Upper Ojai Basin.** Conduct well surveys, interviews and detailed quantitative estimates of crop coverage and water usage to better quantify groundwater extractions, and support analysis of surface water - groundwater interactions in the Upper and Lower Ventura River and Upper Ojai groundwater basins.	x					

Table 4.4.1.2 Tier 2 Priority Projects and Programs *(continued)*

ID#	Tier 2 Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	Improve/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
177	**Mutual Water Co. Equipment Upgrades.** A number of the older mutual water companies have older, inefficient and manual equipment. Equipment upgrades, including automation, could improve water use efficiency.		x				
180	**Sub-Metering.** Install sub-meters on multi-family and other water accounts with multiple users or types of use to better isolate waste and efficiency.		x				
181	**Irrigation Professionals Training.** Host a professional training program for irrigation managers of facilities with large landscapes, such as golf courses, schools and parks.			x			
187	**Graywater Installations.** Install basic graywater equipment in new and existing developments and remodels.		x				
	Goal 2: Clean Water						
45	**Infiltration Systems Installations.** Install or retrofit, at new and existing homes, buildings, landscapes and farms, systems (e.g., bioswales, curb cuts, sponge gardens, permeable pavement) for capturing and infiltrating stormwater.		x				
62	**Lake Casitas Recreation Area Restroom Conversion to Sewer.** Waste is now trucked to the treatment plant daily.		x				S: OVSD
67	**LID Funding Study.** Research options to address the County of Ventura's limited funding for installation and maintenance of low impact development and green streets infrastructure. This needs to become a standard practice, but is now hampered by lack of maintenance funding.	x					
68	**County Road Standards Update.** Update the County's Road Standards to include design plates that allow sidewalks with tree wells or bioswales to advance stormwater infiltration.				x		
70	**Treatment Wetland Feasibility Study.** Research feasibility of installing treatment wetlands for stable/farm runoff.	x					S: RWQCB
	Goal 3: Integrated Flood Management						
81	**Floodplain Restoration Study.** Develop a floodplain restoration feasibility study. Quantify the savings of natural floodplain management via inundation and floodway easements as compared to structural protections.	x					
83	**Overflow Ponds.** Create overflow areas and ponds along storm channels to slow down flow and allow for infiltration.		x				

Table 4.4.1.2 Tier 2 Priority Projects and Programs *(continued)*

ID#	Tier 2 Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	Improve/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
88	**Ordinance Enforcement to Prevent Illegal Floodplain Encroachment.** Improve enforcement of floodplain management and land use regulations to prevent encroachment into floodplains and in channels that create potential flood barriers/hazards.				x		
89	**Stream Setback Ordinance.** Amend the zoning ordinances of Ventura County, the city of Ojai, and the city of Ventura to require a setback buffer from the Ventura river and major streams for development or redevelopment of structures and impermeable surfaces, and for animal keeping.				x		
90	**Permit Streamlining - Channel Maintenance.** Investigate strategies to reduce the cost/burden of keeping channels clear for storm flows.				x		
107	**Flood Management Funding Study.** Research options to address WPD's limited flood management funding for the watershed due to the low amount of new and existing development (and hence property taxes, benefit assessment fees, and land development fees).	x					
	Goal 4: Healthy Ecosystems						
134	**Habitat Conservation Plan (HCP) Completion.** HCPs support incidental take permits, which help landowners legally proceed with activities that might otherwise result in the illegal impacts to a listed species like steelhead. An HCP was started on the river but never completed.	x					S: RWQCB
139	**"No Fishing" Regulation Enforcement.** Fishing is illegal below Matilija Dam and at Wheeler Gorge Campground on the Ventura River; better enforcement is needed.				x		
145	**Beaver Reintroduction Study.** Investigate the feasibility of reintroducing beavers into the watershed to create pools, increase water retention and extend flow. Begin with an investigation of the historical evidence of beaver presence in the Ventura River watershed.	x					S: Surfrider
	Goal 6: Responsible Land and Resource Management						
154	**Intra-County Land Use Planning Task Force.** Coordinate, with the Watersheds Coalition of Ventura County, a countywide task force focused on improving and integrating land use and water resource planning. Raise the funds needed for updates to Ventura County's general plan and zoning ordinance.					x	S: Ventura, County Planning
155	**Existing Local Policy Assessment.** Prepare a report that identifies watershed-relevant local policies (e.g., land use planning, environmental health, flood control, stormwater, fire), analyzes implementation and enforcement status, and recommends improvements.				x		S: County Planning

Table 4.4.1.2 Tier 2 Priority Projects and Programs *(continued)*

ID#	Tier 2 Project or Program	Fill Data Gaps / Analyze	Make Physical Improvements	Educate/Engage/ Incentivize	Improve/Use Regulations & Policies	Plan/Collaborate Regionally	Leads (L) Supporters (S)
168	**Farmland Resources Policies Compliance Monitoring.** Review and comment on proposed city and county land use projects and policies for compliance with city and county general plan goals, policies and programs that support preservation of agriculture in the watershed.				x		
170	**Watershed/River-Friendly Business Certification and Marketing Program.** Implement a program that promotes businesses that meet watershed- or river-friendly minimum standards/best management practices.			x			

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

T2 = Projects and programs 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.

Abbreviations:

Casitas—Casitas Municipal Water District

Coastal Cons.—California Coastal Conservancy

County Planning—Ventura County Planning Division

Friends—Friends of Ventura River

Ojai—City of Ojai

OVGC—Ojai Valley Green Coalition

OVLC—Ojai Valley Land Conservancy

OVSD—Ojai Valley Sanitary District

RCD—Ventura County Resource Conservation District

RWQCB—California Regional Water Quality Control Board – Los Angeles District

SBCK—Santa Barbara Channelkeeper

Surfrider—Ventura Chapter of the Surfrider Foundation

WPD—Ventura County Watershed Protection District

Ventura—City of Ventura

Ventura Water—City of Ventura's Water Division

Appendix 4.4.3 Rainfall Data: 1873 to 2012

Table 4.4.3.1 Rainfall Data 1873–2012

	Rainfall (inches)		
Water Year	Ventura Station #66	Ojai Station #30	Matilija Canyon Station #207
1873	10.47	NA	NA
1874	15.00	NA	NA
1875	15.24	NA	NA
1876	21.00	NA	NA
1877	4.62	NA	NA
1878	22.07	NA	NA
1879	12.82	NA	NA
1880	22.06	NA	NA
1881	14.97	NA	NA
1882	12.42	NA	NA
1883	11.51	NA	NA
1884	36.13	NA	NA
1885	9.46	NA	NA
1886	20.22	NA	NA
1887	14.81	NA	NA
1888	20.25	NA	NA
1889	16.85	NA	NA
1890	26.52	NA	NA
1891	14.52	NA	NA
1892	10.12	NA	NA
1893	23.49	NA	NA
1894	7.47	NA	NA
1895	14.05	NA	NA
1896	10.10	NA	NA
1897	15.70	NA	NA
1898	7.03	NA	NA
1899	8.03	NA	NA
1900	9.48	NA	NA
1901	14.23	NA	NA
1902	12.51	NA	NA
1903	16.26	NA	NA

Table 4.4.3.1 Rainfall Data 1873–2012 *(continued)*

Water Year	Rainfall (inches)		
	Ventura Station #66	Ojai Station #30	Matilija Canyon Station #207
1904	12.62	NA	NA
1905	22.72	NA	NA
1906	19.93	23.50	NA
1907	27.55	37.44	NA
1908	18.94	20.42	NA
1909	26.61	27.82	NA
1910	19.54	23.77	NA
1911	19.32	30.01	NA
1912	13.54	13.06	NA
1913	16.62	18.24	NA
1914	26.74	39.52	NA
1915	21.00	24.03	NA
1916	19.49	29.65	NA
1917	17.99	20.76	NA
1918	21.75	26.86	NA
1919	8.88	14.46	NA
1920	9.40	15.53	NA
1921	14.16	18.50	NA
1922	18.56	26.67	NA
1923	13.57	19.25	NA
1924	6.59	6.88	NA
1925	9.03	11.99	NA
1926	15.52	21.67	NA
1927	16.79	26.22	NA
1928	11.82	15.63	NA
1929	12.03	13.21	NA
1930	10.15	14.01	NA
1931	12.67	17.29	NA
1932	18.49	26.05	NA
1933	8.66	11.64	NA
1934	11.71	13.78	NA
1935	17.89	22.45	NA
1936	13.42	20.35	NA
1937	23.13	29.13	NA
1938	20.89	33.96	NA

Table 4.4.3.1 Rainfall Data 1873–2012 *(continued)*

Water Year	Rainfall (inches)		
	Ventura Station #66	Ojai Station #30	Matilija Canyon Station #207
1939	14.52	14.44	NA
1940	11.08	15.16	NA
1941	36.71	45.24	NA
1942	12.77	17.14	NA
1943	19.88	28.05	NA
1944	18.02	24.16	NA
1945	12.13	18.90	NA
1946	8.67	17.36	NA
1947	9.02	15.36	NA
1948	5.51	9.34	NA
1949	5.85	11.13	NA
1950	10.08	16.74	NA
1951	6.95	10.12	NA
1952	23.78	35.72	NA
1953	9.80	13.97	NA
1954	13.17	19.38	NA
1955	12.54	16.58	NA
1956	14.99	19.81	NA
1957	9.13	13.88	NA
1958	25.65	40.08	NA
1959	6.75	12.22	NA
1960	11.03	13.47	19.73
1961	6.51	8.97	14.98
1962	23.25	30.42	51.53
1963	11.52	17.50	23.11
1964	8.70	11.68	19.44
1965	13.65	19.13	28.74
1966	12.33	23.20	44.93
1967	14.90	32.06	47.87
1968	13.01	14.57	20.60
1969	22.31	46.61	89.05
1970	10.98	16.32	23.84
1971	14.52	20.82	28.71
1972	7.33	11.26	21.77
1973	19.49	32.01	50.51

Table 4.4.3.1 Rainfall Data 1873–2012 *(continued)*

Water Year	Rainfall (inches)		
	Ventura Station #66	Ojai Station #30	Matilija Canyon Station #207
1974	15.30	20.49	23.59
1975	15.42	22.47	34.42
1976	12.35	15.62	25.12
1977	9.54	12.57	16.66
1978	33.56	48.06	81.26
1979	18.59	24.58	34.45
1980	24.67	30.47	47.20
1981	12.36	14.52	23.03
1982	11.96	18.04	28.36
1983	28.23	43.06	73.03
1984	9.73	13.08	21.90
1985	10.24	12.79	19.14
1986	24.13	25.74	45.95
1987	7.05	7.68	13.42
1988	13.92	17.89	31.85
1989	7.94	11.29	14.23
1990	4.88	9.45	12.88
1991	15.15	19.20	33.37
1992	18.02	28.23	45.48
1993	24.44	41.43	73.53
1994	9.99	13.71	20.54
1995	32.60	42.36	78.89
1996	12.12	15.95	19.91
1997	14.17	21.03	31.69
1998	38.65	49.20	78.12
1999	9.39	12.96	14.56
2000	15.10	19.49	30.69
2001	22.59	27.55	39.81
2002	7.15	7.71	10.12
2003	19.85	20.35	33.49
2004	11.64	13.06	20.39
2005	35.93	43.84	87.66
2006	18.11	23.87	41.27
2007	6.66	7.43	9.09
2008	14.07	20.59	37.60

Table 4.4.3.1 Rainfall Data 1873–2012 *(continued)*

Water Year	Rainfall (inches)		
	Ventura Station #66	Ojai Station #30	Matilija Canyon Station #207
2009	10.39	12.91	18.48
2010	16.16	24.08	41.30
2011	19.68	29.27	48.72
2012	8.86	11.35	18.02
Total	**2164.25**	**2279.92**	**1864.03**
Mean (Avg)	**15.46**	**21.31**	**35.17**
Median	**14.12**	**19.20**	**28.74**
Minimum	**4.62**	**6.88**	**9.09**
Maximum	**38.65**	**49.20**	**89.05**

Data Source: Ventura County Watershed Protection District's website: www.vcwatershed.net/hydrodata

Appendix 4.4.4 Water Year Types Based on Runoff at Foster Park

Average annual runoff from each water year between 1930 and 2013 (as measured at Foster Park) was used to assigned one of five water year categories—very wet, wet, normal, dry, and very dry—to each year. An explanation of the method of calculation is provided below the table.

Table 4.4.1 Water Year Types Based on Annual Average Runoff at Foster Park

Water Year	Annual Average Runoff (AF)	Water Year Type[1]
1930	2,827.65	Dry
1931	272.15	Very Dry
1932	57,368.29	Wet
1933	15,780.60	Normal
1934	28,533.95	Wet
1935	40,085.55	Wet
1936	25,482.31	Wet
1937	108,103.23	Very Wet
1938	190,224.08	Very Wet
1939	18,956.61	Normal
1940	10,906.59	Normal
1941	256,308.52	Very Wet
1942	22,193.07	Normal
1943	136,498.97	Very Wet
1944	74,559.63	Wet
1945	30,083.99	Wet
1946	23,340.37	Normal
1947	11,392.20	Normal
1948	45.40	Very Dry
1949	158.81	Very Dry
1950	2,661.63	Dry
1951	0.18	Very Dry
1952	124,530.87	Very Wet
1953	8,443.86	Normal
1954	9,165.78	Normal
1955	895.29	Very Dry

Table 4.4.1 Water Year Types Based on Annual Average Runoff at Foster Park *(continued)*

Water Year	Annual Average Runoff (AF)	Water Year Type[1]
1956	9,969.58	Normal
1957	2,202.18	Dry
1958	161,176.92	Very Wet
1959	5,965.34	Dry
1960	1,362.76	Dry
1961	208.70	Very Dry
1962	59,067.11	Very Wet
1963	2,603.04	Dry
1964	220.99	Very Dry
1965	1,802.86	Dry
1966	36,706.31	Wet
1967	27,954.19	Wet
1968	5,618.20	Dry
1969	250,061.33	Very Wet
1970	9,998.94	Normal
1971	11,315.20	Normal
1972	2,981.66	Dry
1973	47,175.35	Wet
1974	13,533.08	Normal
1975	13,386.67	Normal
1976	1,386.68	Dry
1977	799.26	Very Dry
1978	237,302.42	Very Wet
1979	31,117.06	Wet
1980	130,665.60	Very Wet
1981	7,815.74	Normal

Table 4.4.1 Water Year Types Based on Annual Average Runoff at Foster Park *(continued)*

Water Year	Annual Average Runoff (AF)	Water Year Type[1]
1982	3,811.33	Dry
1983	214,756.83	Very Wet
1984	28,058.92	Wet
1985	2,814.62	Dry
1986	45,132.99	Wet
1987	2,803.73	Dry
1988	4,449.00	Dry
1989	1,431.97	Dry
1990	363.17	Very Dry
1991	19,109.80	Normal
1992	52,041.22	Wet
1993	199,576.81	Very Wet
1994	6,034.01	Dry
1995	277,095.83	Very Wet
1996	12,348.53	Normal
1997	19,075.73	Normal

Table 4.4.1 Water Year Types Based on Annual Average Runoff at Foster Park *(continued)*

Water Year	Annual Average Runoff (AF)	Water Year Type[1]
1998	264,278.29	Very Wet
1999	12,023.12	Normal
2000	18,039.30	Normal
2001	73,889.93	Very Wet
2002	2,756.98	Dry
2003	10,910.92	Normal
2004	5,468.11	Dry
2005	233,952.58	Very Wet
2006	52,422.52	Wet
2007	5,491.90	Dry
2008	52,817.06	Wet
2009	5,466.79	Dry
2010	21,537.22	Normal
2011	51,186.70	Wet
2012	4,832.21	Dry
2013	439.45	Very Dry

Data Source: USGS National Water Information System Website (USGS 2014b)

Key:

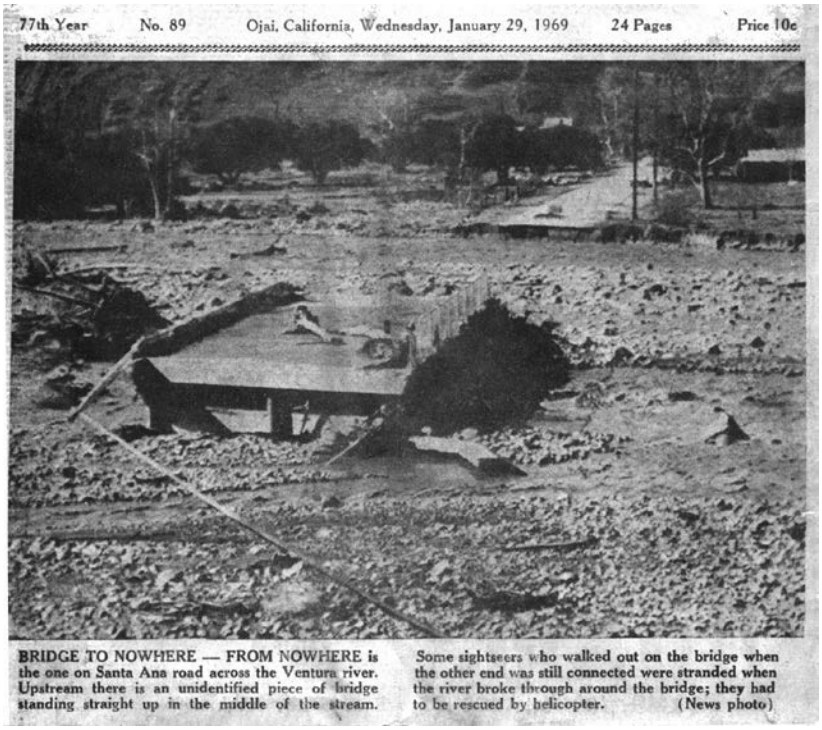
Water Year Type	# of yrs	% of years	Runoff (AF)
Very Dry	10	12%	<1000 AF
Dry	21	25%	>1,000 and <6,200
Normal	21	25%	>6,200 and <24,700; between 50% and 200% of median
Wet	18	21%	>24,700 and <100,000
Very Wet	14	17%	>100,000 AF

The amount of runoff the watershed receives influences many factors discussed in the watershed plan. By assigning each year a water year type, the plan has a consistent way of referring to the type of year or years in any given context.

Average annual runoff from each water year between 1930 and 2013 (as measured at Foster Park) was used to assigned one of five water year categories—very wet, wet, normal, dry, and very dry—to each year. A simple but intuitive division of the runoff years was chosen, which puts the median (12,867 AF/yr) right in the middle of the "normal" category. The table below describes the category divisions that were used. (The historical annual median flow at Foster Park is 17.8 cfs, which translates to 12,867 AF/yr.)

Appendix 4.4.5 Our Most Damaging Flood: 1969

Newspaper Clipping Source:
Ojai Valley News



77th Year No. 89 Ojai, California, Wednesday, January 29, 1969 24 Pages Price 10c

BRIDGE TO NOWHERE — FROM NOWHERE is the one on Santa Ana road across the Ventura river. Upstream there is an unidentified piece of bridge standing straight up in the middle of the stream. Some sightseers who walked out on the bridge when the other end was still connected were stranded when the river broke through around the bridge; they had to be rescued by helicopter. (News photo)

The following is excerpted from a 2004 presentation by Lisa Brenneis and Lauren Coyne hosted by the Ojai Library.

Three significant rainstorms hit Southern California in January and February 1969. Before the storms hit, the Ventura River watershed was experiencing dry conditions and lower than average seasonal rain fall. How quickly things can change.

Gentle rainfall started Saturday, January 18, falling continuously and with increasing intensity. By Tuesday, January 21, 25 inches of rain had fallen in Matilija Canyon.

When the rains began to fall that Saturday there were many hikers and groups in Ventura County's backcountry. Several rescues were carried out during the first couple of days. Most of them were successful, however, one attempt to carry six boys and five men across raging Sespe Creek on a bulldozer turned deadly. The bulldozer stalled midstream; only one man survived.

About 30 hours after the first storm passed, rain began to fall again. Nearly 18 inches of rain fell over the next five days. Watershed soils were already completely saturated so the floodwater, debris, and damage that started in the mountains started to roll down into the valley.

On January 24 over 10 inches fell in 24 hours and flooding became widespread in the Ojai Valley.

This map [see Figure 3.3.2.3.1 1969 Flood Damages Map], produced by the Ventura County Flood Control District, surveys 1969 flood-related damage. The majority of the damage was concentrated in low-lying areas around creeks.

The watershed above Ojai received 43 inches of rain in nine days between January 18 and January 27.

The watershed's infrastructure—reservoirs, mains, pumps, and the diversion canal that feeds water into Lake Casitas—suffered widespread damage.

Lake Casitas' water level had risen 21 feet from January 18 to the 20th before the Robles Diversion Canal, filled with mud and sediment, stopped delivering water to the reservoir.

On January 18 there was only 500 acre-feet of water in Matilija Reservoir but it quickly reached capacity and overflowed on the 21st. Sediment deposited during the storms of 1969 reduced the reservoir's storage capacity from 3,500 acre-feet to just 2,100 acre-feet.

After a disastrous weekend of evacuation rescue and relief efforts, Ojai Valley residents surveyed the wreckage. Floodwaters receded somewhat but Monday found refugees still sheltering at Santa Ana, Nordhoff, and Thacher schools. Power outages flickered up and down the valley all weekend. Highway 33 from Ventura became passable by Saturday afternoon but the roaring Ventura River had severed a water main. Pacific Bell lost the Ojai trunk line at Rancho Arnaz and telephone service in and out of the valley was severely crippled. Southern California Gas lost a 4-inch gas line where it crossed the river.

Road and sewer mains serving Ojai and Oak View were broken in the flood and raw sewage was dumping into San Antonio Creek and the Ventura River.

Many people were displaced throughout the Ojai Valley. Thacher School took in 200 evacuees from the East End and nearly 600 people went to Santa Ana school for shelter. Supplies were ferried by helicopter because road conditions prevented traffic into and out of the area.

Adamson Towing received 300 calls that weekend to rescue cars trapped in mud and debris.

In the East End of the Ojai Valley, the Grand Avenue dip completely filled with debris and Thacher Creek jumped its course, carving a passage down Grand Avenue and then cross-country to join Reeves Creek around McNell Road.

East End residents were cut off for a few days. Both the Grand Avenue and Ojai Avenue bridges across San Antonio Creek were impassable.

East End citrus groves sustained heavy damage and two days after Friday night's flood growers faced a freeze with smudge pots washed away and without power for wind machines.

In the mountains north of Ojai the torrential Ventura River scraped Highway 33 off the side of the mountain by the Ojala resort and at various points north. Crews worked throughout the summer to restore Highway 33.

The City of Ojai suffered blocked storm drains, broken sewer pipes, and a lost police car, but things could have been much worse. During the 1938 flood, damaging floodwaters coursed through downtown Ojai. After the 1938 flood made a mess of downtown, plans for construction of a new storm basin began wending their way through Congress and by 1962 the Stewart Canyon debris basin was completed.

Taxpayers got their money's worth in 1969 when the basin filled to capacity, taking on 22 feet of water at the height of flood Saturday morning. The floodwater passed from the Stewart Canyon basin into a storm drain and was conducted under downtown, sparing downtown Ojai.

Reconstruction efforts started immediately after the January flood.

Heavy equipment and construction crews poured into the valley and started to clear up flood debris and restore roads.

Cleanup and stream reconstruction efforts were well underway when another powerful storm series visited the Ojai Valley. From February 22–26 another 25.5 inches accumulated in watershed and the whole cycle started again. The flood runoff was similar in magnitude to the January flood but there was less debris to wreak havoc in the streams. Reconstruction crews stayed out in the creeks during the storm routing the floodwater. After the storms (and valiant efforts to protect their work in progress) the construction crews went back to work and eventually reconstructed the streambeds and banks, completely rebuilding major waterways in Ventura River watershed—until the next time.

Table 4.4.6.1 Monthly Mean Flow (cfs) near Foster Park (USGS Stream Flow Gauge # 11118500), Water Years 1930–2013

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Min	Max	Avg. Daily	AF/yr
Days/mo	*31.00*	*30.00*	*31.00*	*31.00*	*28.00*	*31.00*	*30.00*	*31.00*	*30.00*	*31.00*	*31.00*	*30.00*	*Month*	*Month*	*cfs for Yr*	*equivalent*
1930	0.00	0.00	0.00	4.30	0.00	36.89	4.38	0.20	0.20	0.17	0.00	0.00	0.00	36.89	3.91	2,827.65
1931	0.00	0.00	0.00	0.00	4.21	0.02	0.31	0.17	0.13	0.00	0.00	0.00	0.00	4.21	0.38	272.15
1932	0.00	0.00	173.82	34.29	660.10	67.71	21.50	9.77	5.04	3.88	2.50	0.48	0.00	660.10	79.25	57,368.29
1933	0.88	0.51	0.14	190.30	42.60	17.20	6.26	1.36	1.81	0.00	0.00	0.00	0.00	190.30	21.80	15,780.60
1934	0.00	0.00	132.40	232.30	70.50	30.10	5.80	0.00	0.00	0.00	0.00	0.00	0.00	232.30	39.42	28,533.95
1935	17.50	9.06	75.00	203.80	50.30	89.70	162.90	38.00	14.00	1.99	0.37	0.23	0.23	203.80	55.37	40,085.55
1936	0.39	0.75	2.72	4.08	304.70	56.60	34.30	29.90	1.64	0.92	0.43	0.00	0.00	304.70	35.20	25,482.31
1937	7.25	0.29	115.50	79.50	785.30	539.60	187.90	66.70	31.50	12.80	7.34	7.90	0.29	785.30	149.33	108,103.23
1938	7.56	7.97	32.50	19.00	736.50	1,954.00	200.90	96.80	53.80	33.00	17.10	15.00	7.56	1954.00	262.77	190,224.08
1939	13.50	10.90	55.70	63.90	45.80	78.20	21.80	12.90	5.12	2.99	1.42	1.80	1.42	78.20	26.19	18,956.61
1940	1.23	0.00	0.07	3.20	111.40	34.50	18.60	9.44	5.15	1.76	0.34	0.14	0.00	111.40	15.07	10,906.59
1941	0.00	0.12	94.80	302.80	1,058.00	1,531.00	874.20	226.40	102.90	56.10	35.80	21.20	0.00	1531.00	354.06	256,308.52
1942	21.40	21.30	74.00	50.50	34.40	31.20	78.30	30.60	14.30	6.24	3.39	2.41	2.41	78.30	30.66	22,193.07
1943	0.95	1.36	1.70	821.60	420.00	758.30	134.50	59.40	33.90	17.40	10.60	6.72	0.95	821.60	188.56	136,498.97
1944	6.11	5.90	27.10	31.70	516.20	442.00	105.50	55.20	30.80	15.80	10.00	7.83	5.90	516.20	102.99	74,559.63
1945	6.60	30.50	13.90	13.60	264.80	90.80	51.90	22.50	10.30	7.75	3.68	1.64	1.64	264.80	41.56	30,083.99
1946	1.65	1.57	96.60	9.90	24.80	127.10	86.70	24.10	6.55	3.09	2.27	0.77	0.77	127.10	32.24	23,340.37
1947	0.44	38.80	74.10	34.80	14.30	12.10	7.50	2.98	2.72	0.46	0.04	0.01	0.01	74.10	15.74	11,392.20
1948	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.21	0.31	0.15	0.06	0.00	0.00	0.31	0.06	45.40
1949	0.00	0.00	0.00	0.00	0.00	2.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.58	0.22	158.81
1950	0.00	0.00	0.67	2.20	36.50	4.90	2.03	0.58	0.00	0.00	0.00	0.00	0.00	36.50	3.68	2,661.63
1951	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18
1952	0.00	0.00	0.35	1,103.00	77.60	656.40	143.10	38.20	11.50	4.80	3.22	2.90	0.00	1103.00	172.02	124,530.87
1953	5.33	14.10	49.40	41.40	18.50	7.59	0.95	1.06	0.80	0.41	0.00	0.10	0.00	49.40	11.66	8,443.86
1954	0.10	0.18	0.11	24.80	49.00	48.80	21.00	7.30	1.54	0.79	0.50	0.44	0.10	49.00	12.66	9,165.78
1955	0.49	0.46	0.51	2.90	1.79	1.45	0.94	3.30	1.21	0.63	0.68	0.47	0.46	3.30	1.24	895.29
1956	0.39	0.13	0.96	115.40	16.00	7.15	6.95	11.40	3.79	0.97	0.52	0.33	0.13	115.40	13.77	9,969.58
1957	0.22	0.31	0.25	7.85	7.15	14.40	4.24	1.45	0.33	0.27	0.19	0.01	0.01	14.40	3.04	2,202.18
1958	0.00	0.00	28.00	13.50	521.10	560.40	1,351.00	140.20	50.60	19.40	21.00	12.30	0.00	1351.00	222.64	161,176.92
1959	6.35	3.19	2.75	14.50	57.00	6.99	2.55	2.74	2.15	1.55	1.04	2.05	1.04	57.00	8.24	5,965.34

Table 4.4.6.1 Monthly Mean Flow (cfs) near Foster Park (USGS Stream Flow Gauge # 11118500), Water Years 1930–2013 *(continued)*

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Min	Max	Avg. Daily	AF/yr
1960	1.19	1.36	0.81	1.38	7.22	0.93	4.52	2.33	1.54	1.25	0.29	0.11	0.11	7.22	1.88	1,362.76
1961	0.77	2.50	0.08	0.12	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.29	208.70
1962	0.00	0.80	1.14	1.16	1,012.00	16.40	4.60	8.60	7.46	4.18	1.63	1.11	0.00	1012.00	81.59	59,067.11
1963	1.71	1.97	0.92	0.93	16.20	5.40	5.53	4.75	3.76	1.79	1.19	0.12	0.12	16.20	3.60	2,603.04
1964	0.00	1.21	0.31	0.45	0.37	0.30	0.57	0.42	0.06	0.00	0.00	0.00	0.00	1.21	0.31	220.99
1965	0.00	0.00	1.92	0.72	0.72	0.51	19.70	3.03	2.96	0.35	0.21	0.00	0.00	19.70	2.49	1,802.86
1966	0.00	277.80	234.30	33.70	25.70	13.00	10.50	6.05	3.73	2.23	1.31	0.62	0.00	277.80	50.70	36,706.31
1967	0.02	2.03	178.60	85.30	17.90	30.20	79.80	28.70	17.80	7.05	6.32	6.08	0.02	178.60	38.62	27,954.19
1968	5.45	12.60	8.07	7.73	8.14	28.60	11.90	7.44	2.51	0.55	0.04	0.00	0.00	28.60	7.76	5,618.20
1969	0.00	0.00	0.00	1,880.00	1,899.00	310.80	77.30	37.10	22.10	17.50	7.96	2.42	0.00	1899.00	345.43	250,061.33
1970	4.18	7.29	15.30	11.60	27.90	69.00	12.10	9.00	5.61	2.60	1.53	0.03	0.03	69.00	13.81	9,998.94
1971	0.07	30.80	72.70	19.40	13.30	16.50	10.80	12.40	6.78	2.20	1.60	0.35	0.07	72.70	15.63	11,315.20
1972	0.00	0.01	33.60	4.88	5.80	2.40	0.80	1.22	0.34	0.00	0.00	0.00	0.00	33.60	4.12	2,981.66
1973	0.00	11.60	2.78	92.80	555.80	76.50	25.70	18.50	13.00	11.40	5.70	9.21	0.00	555.80	65.17	47,175.35
1974	2.23	2.91	4.72	99.90	19.30	34.70	19.00	14.60	8.16	5.45	7.07	5.07	2.23	99.90	18.69	13,533.08
1975	2.54	1.86	37.90	8.77	21.90	101.00	18.20	12.50	7.23	5.11	2.43	1.33	1.33	101.00	18.49	13,386.67
1976	0.49	0.02	0.00	0.00	2.80	2.49	2.80	1.35	0.37	0.00	0.00	13.00	0.00	13.00	1.92	1,386.68
1977	0.01	0.00	0.00	10.30	0.22	1.29	0.02	1.17	0.02	0.00	0.00	0.00	0.00	10.30	1.10	799.26
1978	0.00	0.00	7.73	166.30	1,680.00	1,471.00	420.90	144.90	79.60	38.50	17.40	12.40	0.00	1680.00	327.80	237,302.42
1979	5.90	9.62	15.10	46.10	59.30	173.10	125.70	45.30	17.10	9.20	7.30	3.14	3.14	173.10	42.98	31,117.06
1980	3.60	1.43	2.31	29.80	1,376.00	543.30	114.70	65.40	46.00	20.70	12.70	9.40	1.43	1376.00	180.50	130,665.60
1981	6.35	5.59	5.81	9.25	9.54	58.70	13.20	9.53	5.29	4.21	1.14	0.22	0.22	58.70	10.80	7,815.74
1982	0.05	0.01	0.13	0.72	0.77	17.50	27.50	7.75	4.05	2.87	1.31	0.45	0.01	27.50	5.26	3,811.33
1983	0.12	6.57	37.60	295.90	310.90	1,797.00	758.30	237.50	38.00	37.80	14.50	15.20	0.12	1797.00	296.66	214,756.83
1984	40.90	153.60	151.70	49.70	23.90	22.60	13.40	3.92	2.99	0.91	0.96	0.06	0.06	153.60	38.76	28,058.92
1985	0.00	2.52	14.90	6.04	8.02	6.10	5.90	1.97	1.05	0.20	0.10	0.06	0.00	14.90	3.89	2,814.62
1986	0.05	4.17	7.38	43.20	539.00	104.20	26.60	31.40	11.40	9.00	5.25	6.14	0.05	539.00	62.35	45,132.99
1987	3.65	3.48	3.60	5.48	7.25	13.30	5.10	3.28	1.22	0.26	0.00	0.00	0.00	13.30	3.87	2,803.73
1988	0.00	0.00	0.51	7.59	33.70	17.60	9.85	3.15	1.52	1.00	0.19	0.00	0.00	33.70	6.15	4,449.00
1989	0.01	0.00	1.49	0.00	5.82	8.18	5.02	2.94	0.54	0.03	0.00	0.00	0.00	8.18	1.98	1,431.97
1990	0.00	0.00	0.00	1.21	5.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.20	0.50	363.17

Table 4.4.6.1 Monthly Mean Flow (cfs) near Foster Park (USGS Stream Flow Gauge # 11118500), Water Years 1930–2013 *(continued)*

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Min	Max	Avg. Daily	AF/yr
1991	0.00	0.00	0.00	0.00	2.40	273.70	10.30	11.10	8.50	3.78	1.87	0.00	0.00	273.70	26.40	19,109.80
1992	0.00	0.00	5.59	10.50	752.20	78.30	25.70	13.50	6.41	2.86	1.69	1.61	0.00	752.20	71.89	52,041.22
1993	2.18	0.20	21.50	867.80	1,212.00	801.10	286.30	99.20	48.20	19.80	8.87	7.19	0.20	1212.00	275.69	199,576.81
1994	5.14	1.80	5.36	5.09	57.60	12.90	6.35	4.75	3.46	1.19	0.44	0.01	0.01	57.60	8.34	6,034.01
1995	0.00	0.00	0.11	1,773.00	438.30	1,659.00	402.90	150.10	81.60	35.80	15.90	8.43	0.00	1773.00	382.77	277,095.83
1996	6.72	5.03	6.56	8.84	113.50	37.00	18.30	5.55	4.00	2.41	1.27	0.43	0.43	113.50	17.06	12,348.53
1997	2.05	10.10	57.40	126.70	61.30	19.60	19.90	8.84	3.97	3.27	2.81	1.39	1.39	126.70	26.35	19,075.73
1998	0.23	0.03	71.10	58.60	2,919.00	451.50	409.00	408.00	157.70	63.70	32.20	29.00	0.03	2919.00	365.07	264,278.29
1999	21.80	21.00	19.50	18.10	28.40	21.70	25.00	20.10	11.20	6.38	4.37	2.68	2.68	28.40	16.61	12,023.12
2000	1.19	1.01	0.51	0.51	102.50	79.20	48.90	30.30	19.50	10.60	5.08	3.88	0.51	102.50	24.92	18,039.30
2001	3.57	2.20	0.88	31.90	111.80	893.20	60.80	46.00	27.60	16.30	13.10	8.45	0.88	893.20	102.07	73,889.93
2002	5.58	6.56	4.55	4.64	5.12	5.90	5.30	4.19	2.39	1.25	0.29	0.03	0.03	6.56	3.81	2,756.98
2003	0.07	3.65	5.63	1.61	5.04	62.00	26.70	41.80	13.70	8.81	5.93	4.58	0.07	62.00	15.07	10,910.92
2004	2.15	1.10	1.05	0.31	63.60	10.00	4.80	4.58	3.04	2.15	0.72	0.08	0.08	63.60	7.55	5,468.11
2005	8.23	0.53	201.20	1,825.00	1,227.00	314.80	150.50	84.40	47.00	30.90	22.50	18.80	0.53	1825.00	323.17	233,952.58
2006	18.00	15.80	15.00	81.30	59.00	69.20	449.60	61.00	45.40	27.30	18.60	15.10	15.00	449.60	72.41	52,422.52
2007	13.30	9.90	9.66	8.79	9.57	7.90	7.99	7.82	6.56	4.53	2.85	2.24	2.24	13.30	7.59	5,491.90
2008	1.24	0.67	0.54	631.35	85.60	56.60	33.03	15.58	17.60	11.30	8.44	6.83	0.54	631.35	72.96	52,817.06
2009	5.65	5.38	5.94	5.47	18.40	14.30	10.44	8.07	8.24	3.94	3.05	2.69	2.69	18.40	7.55	5,466.79
2010	3.65	2.50	4.12	114.90	76.86	54.52	35.67	28.81	16.27	9.68	7.00	5.71	2.50	114.90	29.75	21,537.22
2011	5.00	4.74	111.60	27.20	52.20	452.00	64.50	40.70	36.90	21.50	14.50	10.50	4.74	452.00	70.71	51,186.70
2012	9.54	8.03	6.85	6.60	6.63	9.79	14.20	5.60	4.56	3.83	3.65	0.85	0.85	14.20	6.68	4,832.21
2013	0.36	0.26	0.28	0.16	0.35	0.85	1.67	1.83	0.57	0.45	0.32	0.17	0.16	1.83	0.61	439.45
Average	**3.49**	**9.40**	**29.16**	**142.31**	**250.36**	**208.75**	**89.09**	**32.39**	**15.22**	**7.99**	**4.72**	**3.59**	**0.80**	**392.13**	**65.38**	**47,328.98**
Median	**0.63**	**1.36**	**5.04**	**12.55**	**34.05**	**30.70**	**18.25**	**9.22**	**5.14**	**2.87**	**1.48**	**0.55**	**0.03**	**100.45**	**17.77**	**12,867.60**
Max.	**40.90**	**277.80**	**234.30**	**1,880.00**	**2,919.00**	**1,954.00**	**1,351.00**	**408.00**	**157.70**	**63.70**	**35.80**	**29.00**	**15.00**	**2919.00**	**382.77**	**277,095.83**
Min.	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.18**

Note in Leap Years, Feb has 29 days, year has 366 days.

2012–2013 data is provisonal.

1 cfs = 723.92

Source:
http://waterdata.usgs.gov/ca/nwis/monthly/?referred_module=sw&site_no=11118500&por_11118500_2=2207948,00060,2,1929-10,2013-12&partial_periods=on&format=html_table&date_format=YYYY-MM-DD&rdb_compression=file&submitted_form=parameter_selection_list

Appendix 4.4.7 Past Floods In Brief

The following descriptions of past floods in the Ventura River watershed were compiled by the Alluvial Fan Task Force for the California Department of Water Resources (Earp 2007). Following these descriptions, a few coastal floods are highlighted.

March 9, 1911

In January and February there was heavy rainfall and by March the soil was completely saturated. In March there was a serious flood on the Ventura River. The Ventura River ran very high and overflowed its banks from Casitas to the ocean. The bridge at Casitas was underwater, although it was built 17 feet above normal flow for the river. The western part of Ventura was flooded, and the steel railroad bridge was torn out and washed out to sea.

January 1914

Extremely heavy rains in January caused widespread flooding. Homes flooded, roads were damaged, and agricultural lands were destroyed by flood waters. Railroad lines were out, transportation severely hampered, telegraph lines down, and utility services interrupted. The estimated cost of this flood for the County of Ventura amounted to $237,301.

March 1–4, 1938

This was a major flood event for much of Southern California. It caused damages and destruction to agricultural lands, to the railroad, to roads and bridges, and to private homes. The cost of the flood was estimated to be $3,640,504. All rivers in Ventura County flooded. One person died as a result of the flood.

January 21–22, 1943

Heavy storms caused flooding on all rivers of Ventura County. Roads, agricultural lands, and bridges all were damaged or destroyed. Road culverts, ditches, and small dikes were destroyed by this event. Mudslides in steeper locations occurred. The estimated total cost of this event to the County of Ventura was $333,500.

January 18, 1952

Flood damage reported for other areas of the County, but not specifically for the Ventura River watershed.

April 1958

This was a large flooding event, flooding on all rivers of Ventura County. Roads, agricultural lands, and bridges all were damaged or destroyed in this event.

February 7–20, 1962

Heavy rain brought about flooding on all rivers of Ventura. President Kennedy declared Ventura County a disaster area. At Live Oak Creek the Soule Park Golf Course experienced some washout along the creek. The Santa Ana Bridge was washed out at the Ventura River; there was channel damage along Ventura River. The estimated peak flows on the Ventura River were 17,800 cfs. The estimated cost of this event was $425,000.

November and December, 1965

Heavy flooding washed out utilities, including sewer lines and water supply infrastructure. $490,000 in damages was the estimated cost of this event for the County of Ventura. President Johnson declared Ventura County a disaster area. Roads, agricultural lands, and bridges were damaged or destroyed in this event.

November and December 1967

This flood caused an estimated $510,000 in damages. Ventura County was declared a disaster area by President Johnson. In November the Santa Ana Bridge was washed out by flood waters as well as a few more minor bridges along the Ventura River. State Highway 150 was closed due to landslides and flooding as well as many other roads.

January 1969

The State of California was declared a disaster area by President Nixon during this event. One person lost their life to a mudslide; 12 people died as a result of drowning in January. Sewer and water supply lines were washed out, posing a health risk to residents. Highway damage was heavy in Ventura County.

February 1969

The February event led to the flooding of all rivers of Ventura County. Bridges and roads were destroyed and transportation was interrupted. Sewer plants were damaged and untreated sewage flowed into the Ventura River and San Antonio Creek for two weeks until repairs were made. In Ventura County flood flows were of unprecedented magnitude. The cost of the 1969 flood for Ventura County was estimated at $43 million.

1978

At the Ventura River 26 homes and businesses in the Ojai Valley were damaged. 200 people were evacuated from this area. Roads and bridges in this area were damaged. Railroad lines were damaged. Utilities in this area had severe damages to lines. Power lines were toppled when poles became undermined by flowing water. Seven homes in the Matilija Canyon were damaged. Matilija Lake Campground was 80% destroyed. Main Street Bridge at Ventura River was severely damaged and closed. Total cost for this flood period for Ventura County: $20 million.

February 26–March 1, 1983

Winter storms brought heavy rains to Ventura County, and President Reagan declared it a disaster area. Damages were estimated for the County of more than $39 million. Because this flooding event coincided with extremely high tides—the highest of the year—damages to Ventura County were compounded. Highways, homes, recreational lands, and utilities were all destroyed by this combination of events. The floods closed 28 roads in the County.

February 10–15, 1992

President Bush declared Ventura County a disaster area on February 21 after a series of thunderstorms brought heavy rains to the area earlier in the month. The Ventura River at Highway 101 peak flow was estimated at 45,800 cfs. Live Oak Creek got jammed with debris backing up at bridges in the Oak View area and a nursing home was flooded. The Ventura River overflowed at Ventura and overtopped the west bank at the Highway 101 Bridge. Flows flooded agricultural lands, the Ventura Beach Recreational Vehicle Resort and Highway 101. Highway 101 was closed to traffic for about 3 hours. 110 people were rescued from the resort and motor homes were evacuated from the location. Some were swept out to sea, or flooded however. One person died as a result of flooding in this location.

January and February 1993

Minor flooding occurred in Ventura County, with localized flooding in the Live Oaks Acres area when Coyote Creek overflowed and flooded Santa Ana Road. Mudslides and minor road washouts were the extent of the problems in Ventura County from this event.

January and March 1995

A series of strong storms brought heavy rains to Ventura County and on March 10 President Clinton declared Ventura County a disaster area. Flooding damaged homes, businesses, public faculties, highways, bridges, and flood control infrastructure. It also ruined or damaged

agricultural lands. One person died in January due to this flooding event. More than 12.5 inches of rain fell on Matilija Creek, and caused homeless encampments to scurry to higher ground. Two people had to be rescued from the river. Highway 101 was flooded and an RV park was flooded with up to 6 feet of water.

Emergency rescue crews in helicopters had to evacuate 33 people stranded in this location. Many transportation routes were hindered by flood waters and debris. La Conchita, a small seaside village along the coast, was hit hard by a landslide that crushed nine houses. Another 140 houses in this location were evacuated, but all 700 residents were given evacuation warnings.

January 7–11, 2005

After 5 days of very heavy rains, a landslide at the small town of Conchita was triggered and demolished 13 houses, severely damaged 23 others, and led to the deaths of 10 people. The landslide coincided with the heaviest rain of this storm. On February 4, President Bush declared seven counties in Southern California disaster areas, including Ventura County.

On the Coast

The following descriptions of a few of the coastal floods experienced in the watershed are from a Federal Emergency Management Agency Flood Insurance Study (FEMA 2010).

December 9, 1907

Four hundred feet or more of the Ventura County wharf was carried out to sea by high, turbulent waves. Shortly after noon, the waves, concurrent with a high tide, lifted the deck of the wharf and deposited the deck and piles into the ocean. The entire deck was destroyed except for one pile indicating where the wharf had been. Later, the wreckage was washed onshore and the beach below Ash Street was strewn with lumber. The entire loss was difficult to estimate. Besides the loss to the structure itself, there was a loss of oil pipes and loading fixtures, a derrick engine, and lumber.

December 1969

High waves stemming from intense storms in the Aleutian Islands hit the Ventura County shoreline from December 4 to 7. The swell was measured at 20 feet. A final set of waves hit the shoreline on December 19. Shorefront homes were damaged. Total damage was estimated at hundreds of thousands of dollars.

Winter 1977–78

A combination of high astronomical tides, strong onshore winds, and high storm waves resulted in significant coastal flooding in Ventura County. Storm wave damage to private property in Ventura County exceeded $300,000. The major impact areas were Mussel Shoals, Faria Beach Colony, and Oxnard Shores. In Faria Beach Colony alone, over 25 beachfront homes suffered broken windows, flooded interiors, and damaged or destroyed seawalls, bulkheads, stairs, patios, and decks.

Approximately $135,000 was required to restore state beaches and facilities damaged by storm waves. For example, at Emma Wood State Beach, the beach and recreational vehicle parking area was eroded, the concrete base of a lifeguard tower was washed away, and the road into the park was destroyed.

Other damages resulting from high waves occurred at various points along the Ventura County coastline. Sections of old U.S. Highway 101 were damaged when protective rock was removed and debris was deposited on the highway by wave action. The Ventura Marina was also damaged by wave action. Armor rock was badly displaced along parts of the marina breakwater, navigation lights were damaged, and a concrete walk was destroyed, requiring repairs amounting to between $200,000 and $300,000.

- Costs of storm damage totaled approximately $50 million in Ventura County.
- Waves overtopped the revetment backing North Rincon Parkway, flooding and damaging a road.
- Waves overtopped a revetment in Faria and flooded areas.
- Waves overtopped the revetment backing Emma Wood State Beach and damaged a road.
- The beach at Surfers' Point eroded while waves overtopped a revetment and flooded the bike path and parking lot (FEMA 2011).

Appendix 4.4.8 Storm Event Peak Flows at Foster Park: 1933–2013

Table 4.4.8.1 Storm Event Peak Flows, Foster Park (Station 608), 1933–2013

Date	Peak Flow (cfs)[1]	Stage (ft)[2]
01/20/1933	13,000	12.20
01/01/1934	23,000	14.80
01/06/1935	6,010	9.40
02/13/1936	3,330	8.18
02/15/1937	13,900	10.68
03/03/1938	39,200	19.20
12/19/1938	756	0.00
01/05/1939	860	0.00
03/09/1939	2,840	6.90
02/01/1940	188	0.00
02/03/1940	346	0.00
02/25/1940	4,330	6.98
12/23/1940	9,100	0.00
01/24/1941	8,200	0.00
03/01/1941	15,200	10.65
03/03/1941	13,100	0.00
03/04/1941	12,000	0.00
03/04/1941	11,300	0.00
12/28/1941	1,190	5.12
04/14/1942	850	0.00
01/22/1943	10,500	0.00
01/22/1943	8,080	0.00
01/22/1943	35,000	14.58
03/03/1943	6,240	0.00
03/04/1943	9,900	0.00
02/20/1944	1,750	0.00
02/21/1944	9,500	0.00
02/22/1944	20,000	9.96
02/29/1944	1,000	0.00
03/02/1944	3,300	0.00
03/04/1944	1,650	0.00
11/11/1944	1,200	0.00

Table 4.4.8.1 Storm Event Peak Flows, Foster Park (Station 608), 1933–2013 *(continued)*

Date	Peak Flow (cfs)[1]	Stage (ft)[2]
02/02/1945	17,000	9.20
03/17/1945	870	0.00
12/21/1945	4,500	0.00
02/03/1946	430	0.00
03/30/1946	8,000	6.50
11/13/1946	185	0.00
11/20/1946	2,400	4.87
11/23/1946	800	0.00
12/25/1946	1,150	0.00
12/25/1946	1,500	0.00
12/27/1946	490	0.00
03/25/1948	2	2.16
03/12/1949	35	0.00
02/06/1950	2,000	8.36
03/02/1951	0	3.53
01/15/1952	29,500	15.50
03/07/1952	1,440	7.08
03/15/1952	24,600	14.45
11/15/1952	539	5.86
12/01/1952	640	6.00
12/20/1952	1,040	6.44
12/28/1952	712	6.09
12/30/1952	801	6.19
01/25/1954	2,120	8.17
02/13/1954	3,030	8.78
03/20/1954	1,460	7.60
01/19/1955	203	5.94
01/26/1956	4,050	9.95
01/13/1957	936	7.66
03/01/1957	790	7.41
12/17/1957	1,890	8.85
02/04/1958	4,840	11.83
02/19/1958	5,000	11.95
02/25/1958	3,350	10.65
03/16/1958	4,670	11.70
03/22/1958	4,740	11.55
03/27/1958	1,070	7.88

Table 4.4.8.1 Storm Event Peak Flows, Foster Park (Station 608), 1933–2013 *(continued)*

Date	Peak Flow (cfs)[1]	Stage (ft)[2]
04/03/1958	18,700	17.25
04/07/1958	4,930	10.72
01/06/1959	1,910	8.19
02/11/1959	1,420	7.65
02/16/1959	3,220	9.50
02/01/1960	966	7.38
11/07/1960	308	6.77
02/10/1962	12,400	13.55
02/15/1962	3,840	10.57
02/19/1962	4,100	10.70
02/09/1963	1,060	9.86
11/21/1963	132	7.83
04/09/1965	744	11.43
11/17/1965	1,500	11.13
11/24/1965	11,200	16.75
12/29/1965	10,700	16.55
12/03/1966	708	10.97
12/06/1966	9,900	17.30
01/22/1967	1,150	12.10
01/24/1967	5,240	15.35
04/11/1967	1,020	11.55
03/08/1968	665	11.61
01/21/1969	16,600	21.18
01/25/1969	58,000	24.30
02/06/1969	7,280	10.54
02/25/1969	40,000	21.20
03/01/1970	1,570	8.04
03/04/1970	1,930	8.45
11/29/1970	2,750	9.10
12/18/1970	2,540	8.89
12/21/1970	3,120	9.40
12/25/1971	810	7.06
12/27/1971	2,090	8.95
11/14/1972	1,280	7.14
01/16/1973	2,000	8.05
01/18/1973	14,600	14.64
02/06/1973	3,940	9.68

Table 4.4.8.1 Storm Event Peak Flows, Foster Park (Station 608), 1933–2013 *(continued)*

Date	Peak Flow (cfs)[1]	Stage (ft)[2]
02/11/1973	15,700	15.00
02/27/1973	1,120	6.76
03/20/1973	979	6.53
01/08/1974	2,540	8.59
03/09/1975	5,150	11.07
09/30/1976	1,990	8.58
01/03/1977	856	8.01
02/11/1978	63,600	19.14
03/29/1979	4,280	7.43
02/17/1980	37,900	14.60
03/02/1981	1,210	4.52
04/02/1982	834	4.06
03/02/1983	27,000	14.46
12/26/1983	1,500	4.94
12/20/1984	412	5.04
02/15/1986	22,100	13.37
03/07/1987	174	4.66
03/01/1988	4,000	9.76
12/21/1988	236	4.98
02/17/1990	516	6.10
03/19/1991	11,300	4.67
02/12/1992	45,800	20.66
01/18/1993	12,500	15.12
02/20/1994	1,820	8.70
01/10/1995	43,700	21.16
02/20/1996	3,660	7.38
01/26/1997	4,960	8.32
02/23/1998	38,800	17.33
01/31/1999	106	2.31
02/23/2000	3,280	6.24
03/06/2001	19,100	11.30
11/24/2001	191	3.63
03/15/2003	5,100	7.05
02/26/2004	6,340	7.45
10/19/2004	769	0.00
12/28/2004	3,590	0.00
12/31/2004	20,600	0.00

Table 4.4.8.1 Storm Event Peak Flows, Foster Park (Station 608), 1933–2013 *(continued)*

Date	Peak Flow (cfs)[1]	Stage (ft)[2]
01/03/2005	4,730	0.00
01/09/2005	29,400	0.00
01/10/2005	41,000	17.08
02/19/2005	3,860	0.00
02/21/2005	18,800	0.00
03/22/2005	1,910	0.00
01/02/2006	6,690	0.00
02/28/2006	4,140	0.00
03/28/2006	1,750	0.00
04/01/2006	465	0.00
04/04/2006	9,250	7.78
04/14/2006	243	0.00
01/28/2007	92	2.67
01/04/2008	10,000	12.31
01/23/2008	2,810	0.00
01/24/2008	5,010	0.00
01/27/2008	14,400	0.00
02/16/2009	136	7.13
01/18/2010	1,740	10.48
01/20/2010	3,100	11.84
01/21/2010	2,060	10.84
02/27/2010	723	8.88
12/19/2010	3,250	11.97
12/22/2010	2,110	11.85
02/18/2011	282	7.78
02/25/2011	642	8.76
03/20/2011	19,100	17.31
03/25/2011	3,170	11.89
04/13/2012	180	7.68
04/11/2013	5	6.21

1: cfs – cubic feet per second.

2: Stage is the level of the water surface above a reference height at a given location.

Data Source: VCWPD's Hydrologic Data Server (VCWPD 2014d)

Appendix 4.4.9 Ventura River Mainstem Flood Risk Areas

The following descriptions of potential flood risk along the Ventura River, unless otherwise cited, were derived from the U.S. Bureau of Reclamation's 2007 report, *Hydrology, Hydraulics and Sediment Studies of Alternatives for the Matilija Dam Ecosystem Restoration Project* (USBR 2007).

Matilija Dam downstream to Matilija Canyon Mouth. This reach contains little development except the closed Matilija Hot Springs facility, the lower grounds of which do get inundated in flows above the 2% AEP (previously known as the 50-year flood).

Matilija Canyon mouth downstream to Highway 150 Bridge. In this reach of the river there are a number of structures and facilities located in the 1% AEP flood zone that are at risk of inundation. These include most of the houses and structures upstream and downstream of Camino Cielo Bridge, the Robles Diversion Dam, and the houses, horse stables, and orchards in the river bottom in Meiners Oaks, along Oso, Meyers, and North Rice roads, most of which were built at grade with no significant first floor elevation.

Below Highway 150 Bridge to San Antonio Creek Confluence. This reach of the river in Oak View contains the Live Oak Acres neighborhood, which was built in the floodplain and significantly narrows the river channel in this area. The Santa Ana Boulevard Bridge at the south end of the neighborhood is also challenged with managing the flow of the Ventura River in a very constricted space. The Live Oak levee was built to protect the neighborhood, and this runs from the Santa Ana Bridge north for 1.28 miles to about where Riverside Road meets Burnham Road. Given the extreme imposition on the floodplain, this area has had and continues to have flooding and related erosion problems.

Below San Antonio Creek Confluence to Foster Park. This reach of the river contains the community of Casitas Springs. The Casitas Springs levee runs along the east bank of the river for about a mile between the community and the river, but does not provide protection from the 1% AEP flood and many homes are at risk of flood inundation. At least 50 mobile homes in Casitas Springs are located close to the river where there is no protective levee. Foster Park is located within the 1% AEP flood zone and has a history of flooding.

Below Foster Park to the River Mouth. The lower end of the river is often one of the first areas to have issues with flooding. This reach of the river contains businesses, industrial areas, a few houses, a school, the Ojai Valley Sanitary District's wastewater treatment plant, the City of Ventura's water filtration plant, and agricultural lands. These structures and operations are all located in or near the 1% AEP flood zone. A recreational vehicle park, located adjacent to Highway 101 and actually in the floodway and on the delta of the river, has experienced repeated major flooding. The deltas of sediment-loaded rivers like the Ventura River do not tend to have static channels. The floodplain widens, the water slows, sediments get deposited, and the river splits into multiple "distributary" channels, which move and meander over time (Keller and Capelli 1992). Highway 101 has even been closed in this stretch due to flooding. Emma Wood State Beach, on the delta on the south side of Highway 101, is also subject to flooding. The North Ventura Avenue area can also experience flooding from the river (VCWPD 2013b). The Ventura River levee, which protects the City of Ventura and Highway 33, extends on the east side of the river from the Pacific Ocean upriver about 2.65 miles. A smaller estuary to the west of the main estuary floods during major storms.

Appendix 4.4.10 Robles Diversion Data

Table 4.4.10.1 Monthly Diversions at the Robles Diversion Facility, in Acre Feet by Water Year

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
1960	0	0	0	0	24	0	0	0	0	0	0	0	24
1961	0	0	0	9	0	0	0	0	0	0	0	0	9
1962	0	0	23	0	13564	6882	1438	31	0	0	0	0	21938
1963	0	0	0	0	2043	896	0	0	0	0	0	0	2939
1964	0	0	0	10	0	0	168	0	0	0	0	0	178
1965	0	0	176	0	0	0	4955	79	0	0	0	0	5210
1966	0	11676	4729	11440	3754	418	0	0	0	0	0	0	32017
1967	821	108	8782	6284	1170	5023	10488	8909	1571	478	0	0	43634
1968	454	291	504	0	16	339	0	0	0	0	0	0	1604
1969	0	715	0	4924	11902	16623	8654	2685	1507	2710	360	0	50080
1970	0	76	908	312	988	7347	404	0	0	0	0	365	10400
1971	0	575	5868	3460	2011	24	0	0	861	0	0	0	12799
1972	0	550	4051	1093	0	0	0	0	0	0	0	620	6314
1973	0	5	0	3445	15331	14219	4274	1435	0	0	0	0	38709
1974	0	884	0	6431	501	2437	539	0	0	0	0	0	10792
1975	0	397	1427	0	1090	8876	1826	686	0	0	0	0	14302
1976	0	510	0	0	2855	0	0	0	0	0	0	583	3948
1977	0	0	0	0	0	0	0	50	0	0	0	0	50
1978	0	0	1044	7290	13204	7034	0	0	1167	0	0	0	29739
1979	0	0	0	0	4712	1796	0	670	0	1667	0	0	8845
1980	0	0	0	1456	1127	134	0	0	0	0	0	0	2717
1981	0	0	0	203	0	5018	551	0	0	0	0	0	5772
1982	0	0	0	599	0	1492	3582	494	74	0	0	0	6241
1983	0	657	3035	8994	8791	0	0	0	1138	1430	218	536	24799
1984	0	0	1024	0	1130	0	0	0	0	0	0	0	2154
1985	0	0	957	528	1	0	0	0	0	0	0	0	1486
1986	0	1522	964	1385	14926	14415	5430	1418	1742	0	0	0	41802
1987	0	0	0	0	0	1034	0	0	0	0	0	0	1034
1988	0	0	580	1368	1533	4725	885	643	0	0	0	0	9734
1989	0	0	0	0	524	0	0	0	0	0	0	0	524
1990	0	0	0	0	0	0	0	0	0	0	0	0	0
1991	0	0	0	0	367	11776	4186	925	0	0	0	0	17254
1992	0	0	366	1026	14826	15898	7228	2460	413	0	504	0	42721

Table 4.4.10.1 Monthly Diversions at the Robles Diversion Facility, in Acre Feet by Water Year *(continued)*

WY	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
1993	0	0	1847	21012	10886	0	0	963	1039	785	0	0	36532
1994	0	0	0	0	1645	932	0	927	0	0	0	0	3504
1995	0	0	0	1323	0	0	0	0	0	0	0	0	1323
1996	0	0	0	0	0	1291	0	371	0	0	0	0	1662
1997	0	354	3355	7134	1843	917	0	0	0	0	0	0	13603
1998	0	0	2002	1366	4972	0	0	0	0	0	0	0	8340
1999	0	0	0	0	0	0	0	0	0	0	0	0	0
2000	0	0	0	0	1459	3023	0	0	0	0	0	0	4482
2001	0	0	0	451	2140	11695	1039	0	0	0	0	0	15325
2002	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	982	264	325	0	0	0	0	1571
2004	0	0	0	0	1010	0	0	0	0	0	0	0	1010
2005	0	0	1675	12925	9297	4568	0	116	0	0	0	0	28581
2006	0	0	0	772	246	1283	8525	1593	0	0	0	0	12419
2007	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	4137	4707	1083	0	0	0	0	0	0	9927
2009	0	0	0	0	365	119	0	0	0	0	0	0	484
2010	0	0	0	3461	1954	685	368	0	0	0	0	0	6468
2011	0	0	2253	878	714	8151	5548	1546	149	0	0	0	19239
2012	0	0	0	0	0	12	75	0	0	0	0	0	87
2013	0	0	0	0	0	0	0	0	0	0	0	0	0
Avg	**24**	**339**	**844**	**2106**	**2919**	**2984**	**1304**	**488**	**179**	**131**	**20**	**39**	**11376**
Median	**0**	**0**	**0**	**107**	**999**	**790**	**0**	**0**	**0**	**0**	**0**	**0**	**6007**
Max	**821**	**11676**	**8782**	**21012**	**15331**	**16623**	**10488**	**8909**	**1742**	**2710**	**504**	**620**	**50080**
Min	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Appendix 4.4.11 Ongoing Surface Water Quality Monitoring Programs in Ventura River Watershed

Surface water quality in the Ventura River watershed is routinely monitored by a number of agencies and organizations. The location, frequency, and constituents monitored are different depending upon the purpose of the monitoring. These programs are subject to change, especially as regulatory requirements change.

Table 4.4.11.1 Ongoing Surface Water Quality Monitoring Programs in Ventura River Watershed

						Physical/General Water Quality								Anions				
ID#	Monitoring Program	Type of Water	# of Sites	Monitoring Locations	Frequency	Flow	Physical Condition	Temperature	pH	Dissolved Oxygen	Conductivity	Salinity	Turbidity	Chloride	Fluoride	Bromide	Perchlorate	Sulfate
1	Casitas Municipal Water District	Surface	13	Ventura River, Santa Ana Creek, Coyote Creek and Lake Casitas; 7 are surface water; 6 in the lake	Variable		x	x	x	x	x		x	x	x		x	x
2	City of Ventura	Surface	3	Nye wells 7, 8 and 11 are groundwater under direct influence of surface water (GWUDISW)	Monthly, yearly, other	x	x	x	x		x		x		x	x	x	x
3	City of Ventura	Subsurface	1	Intake (SC1)	Monthly, yearly, other	x	x	x	x		x		x		x	x		x
4	City of Ventura	Surface	1	Ventura River/Foster Park	Monthly, yearly, other	x	x	x	x		x		x		x	x	x	x
5	City of Ventura	Surface	1	San Antonio Creek (at bridge)	Monthly	x	x	x	x		x		x					
6	City of Ventura	Surface	1	Treatment Influent	Monthly, yearly													
7	City of Ventura	Surface	1	Kingston Reservoir	Monthly, yearly	x	x	x	x		x		x	x	x	x		x
8	Ojai Valley Sanitary District	Surface	1	Influent	Variable	x			x									
9	Ojai Valley Sanitary District	Surface	1	Effluent	Variable	x		x	x	x			x	x	x			x
10	Ojai Valley Sanitary District	Surface	1	Ventura River (R3), 550 yds. upstream of discharge	Monthly, quarterly for nitrogen	x		x	x	x			x	x				x
11	Ojai Valley Sanitary District	Surface	1	Ventura River (R4), 15 yds. downstream of discharge	Monthly, quarterly for nitrogen	x		x	x	x			x	x				x
12	Ojai Valley Sanitary District	Surface	1	Ventura River (R5), 1000 yds. downstream of confluence with Canada Larga	Monthly, quarterly for nitrogen	x		x	x	x			x	x				x
13	Santa Barbara Channelkeeper -Ventura Stream Team	Surface	18	Ventura River Estuary; Ventura River @ Main Street Bridge, Foster Park, Santa Ana Road Bridge, Highway 150, Canada Larga, Camino Cielo, OVSD, SA Creek; San Antonio Creek @ Confluence with Ventura River, Lion Canyon, and Stewart/Fox Creek; Lower Canada Larga Creek; Lion Canyon; Stewart/Fox Creek; N. Fork Matilija Creek, Upper Matilija Creek, Upper North Fork Matilija Creek, N. Fork Matilija at Wheeler Gorge	Monthly	x		x	x	x	x		x					
14	Ventura County Agricultural Irrigated Lands Group	Surface	2	Thacher Creek @ Ojai Ave., San Antonio Creek @ Grand Ave.	4 times per year (2 wet, 2 dry)[1]	x		x	x	x	x		x	x				x
15	Ventura County Environmental Health Division	Ocean	3	Surfer's Point and Promenade Park at Figueroa and Paseo de Playa	Weekly													
16	Ventura County Watershed Protection District, on behalf of Stormwater Monitoring Coalition	Surface	7/yr (31 total)	6 new random sites each year and one "trend" site monitored for the term of the study	Annually in spring, 5 year study[2]	x	x	x	x	x	x			x				x
17	Ventura County Watershed Protection District, on behalf of Ventura Countywide Stormwater Monitoring Program (MS4)	Surface	3	Mass emission station (OVSD) and major outfall stations (Meiners Oaks-Happy Valley Drain and Ojai-Fox Canyon Barranca)	3 wet weather and 1 dry weather[3]	x		x	x	x	x	x	x	x	x		x	

1. Two samples were taken in 2008, none in 2009, and one in 2010.

2. From 2001–2006, bioassessment monitoring was conducted once a year in the fall at 15 sites. A new program, conducted by SCCWRP, started in spring, 2009.

3. Mass emission stations are located in the lower reaches of the watersheds, and as such, the drainage areas are much larger than the drainage areas associated with major outfall stations, and include large contributions from other sources of discharge, such as wastewater treatment plants, agricultural runoff, non-point sources, and ground-water discharges. The purpose of mass emission monitoring is to identify pollutant loads to the ocean and identify long-term trends in pollutant concentrations.

	Cations		Nutrients		Conventional Water Quality Parameters															Metals	Organic Chemicals						Bacteriological					Toxicity/Biological				
ID#	Calcium	Magnesium	Nitrogen - N	Phosphorus -P	Alkalinity as CaCO3	Biological Oxygen Demand (BOD)	Chemical Oxygen Demand (COD)	Cyanide	Hardness as CaCO3	Phenolics	Specific Conductance	Surfactants (MBAS)	Total Residual Chlorine	Total Dissolved Solids (TDS)	Total Suspended Solids (TSS)	Total Organic Carbon (TOC)	Volatile Suspended Solids (VSS)	Metals	Pesticides/Herbicides	PCBs	PAHs	Semivolatiles	Volatiles	Hydrocarbons	Total Coliform & Fecal Coliform	E. Coli	Enterococcus	Crypto	Giardia	Aquatic Toxicity	Benthic Macroinvertebrates	Periphyton Chlorophyll a	Riparian Condition (CRAM)	Radiological
1	x	x	x	x	x			x	x		x	x		x				x					x		x	x		x	x					x
2	x	x	x	x	x				x		x		x			x		x	x				x		x	x								x
3	x	x	x	x	x				x		x		x			x		x	x				x		x	x								x
4	x	x	x	x	x				x		x		x			x		x	x				x		x	x		x	x					
5																												x	x					
6																x		x							x	x								
7	x	x	x	x	x				x		x		x	x		x		x							x	x		x	x					
8			x	x		x									x			x				x	x											
9			x	x		x			x			x	x	x	x			x				x	x	x	x					x				x
10			x	x		x			x			x	x	x				x				x	x	x	x					x		x		
11			x	x		x						x	x	x				x				x	x	x	x					x		x		
12			x	x		x						x	x	x				x				x	x	x	x							x		
13			x	x																					x	x	x								
14			x	x										x	x				x											x				
15																									x	x	x								
16	x		x	x	x				x									x	x	x	x									x	x	x	x	
17	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x			x				

Appendix 4.4.12 Southern California Steelhead DPS Recovery Action Table for Ventura River Sub-Watersheds

The following table is excerpted from the Southern California Steelhead Recovery Plan (NMFS 2012). DPS stands for "distinct population segment," and BPG stands for "Biogeographic Population Group." See "3.6.2 Steelhead" for more information.

Table 4.4.12.1 Southern California Steelhead DPS Recovery Action Table for Ventura River Sub-Watersheds (Monte Arido Highlands BPG)

Action#	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B,3A, 3B)	Task Duration	Estimated Costs ($)					
							FY 1–5	FY 6–10	FY 11–15	FY 16–20	FY 21–25	FY 1–100
Mainstem Ventura River												
VenR-SCS-1.1	Develop, adopt, and implement agricultural land- use planning policies and standards	NRCS, USFWS, NMFS, CDFG, CT, SCHR, EII, TCFT, VC	Agricultural Development	1, 4	2B	20–refer to regional costs	0	0	0	0	0	0
VenR-SCS-1.2	Manage livestock grazing to maintain or restore aquatic habitat functions	NRCS, BLM, USFWS, NMFS, CDFG, CT, SCHR, EII, TCFT, VC	Agricultural Development	1, 4,	2B	5	47520	0	0	0	0	47520
VenR-SCS-1.3	Manage agricultural development and restore riparian zones	NRCS, BLM, USFWS, NMFS, CDFG, CT, SC HR, EII, TCFT, VC	Agricultural Development	1, 4	2B	2–refer to regional costs	0	0	0	0	0	0
VenR-SCS-2.1	Develop and implement a plan to minimize runoff from agricultural activities	NRCS, NMFS, R WQCB, CDFG, CT, SCHR, EII, TCFT, VC	Agricultural Effluents	1, 4	2B	20–refer to regional costs	0	0	0	0	0	0
VenR-SCS-3.1	Develop and implement plan to remove or modify fish passage barriers within the watershed	USFS, USFWS, USDOT, NMFS, CDFG, CDOT DWR, CT, SCHR, EII, TCFT, VC	Culverts and Road Crossings (Passage Barriers)	1, 4	3A	20–refer to regional costs	0	0	0	0	0	0
VenR-SCS-4.1	Provide fish passage around dams and diversions (e.g., Foster Park, Robles diversions)	BOR, NMFS, USFWS, SWRCB, CDFG, DWR, CT, SCHR, EII, TCFT, VC	Dams and Surface Water Diversions	1, 3, 4	1A	20	TBD	TBD	TBD	TBD	TBD	TBD
VenR-SCS-4.2	Develop and implement a water management plan for diversion operations (e.g., Foster Park, Robles diversions, etc.)	BOR, NMFS, CDFG, CT, SCHR, EII, TCFT, VC	Dams and Surface Water Diversions	1, 3, 4	1B	5	TBD	TBD	TBD	TBD	TBD	TBD
VenR-SCS-4.3	Develop and implement a water management plan for dam operations (e.g., Casitas and Matilija)	BOR, NMFS, USGS, CDFG, CT, SCHR, EII, TCFT, VC	Dams and Surface Water Diversions	1, 3, 4	1B	100	TBD	TBD	TBD	TBD	TBD	TBD
VenR-SCS-5.1	Develop and implement flood control maintenance program	NRCS, ACOE, USFWS, NMF, CCC, CDFG, CT, SCHR, EII, TCFT, VC	Flood Control Maintenance	1, 4	2B	100	0	0	0	0	0	0

Table 4.4.12.1 Southern California Steelhead DPS Recovery Action Table for Ventura River Sub-Watersheds (Monte Arido Highlands BPG) *(continued)*

Action#	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B,3A, 3B)	Task Duration	Estimated Costs ($)					
							FY 1–5	FY 6–10	FY 11–15	FY 16–20	FY 21–25	FY 1–100
VenR-SCS-6.1	Conduct groundwater extraction analysis and assessment	USGS, NMFS, CDFG, CT, SCHR, EII, TCFT, VC	Groundwater Extraction	1, 4	1A	5	275550	0	0	0	0	275550
VenR-SCS-6.2	Develop and implement groundwater monitoring and management program	USGS, NMFS, CDFG, CT, SCHR, EII, TCFT, VC	Groundwater Extraction	1, 4	1A	10	254350	39775	0	0	0	294125
VenR-SCS-7.1	Develop and implement stream bank and riparian corridor restoration plan	NRCS, USGS, A COE, BLM, USFWS, NMFS, CDFG, CT, SCHR, EII, TCFT, VC	Levees and Channelization	1, 4	2B	100	0	0	0	0	0	0
VenR-SCS-7.2	Develop and implement a plan to restore natural channel features	NRCS, USGS, U SFWS, ACOE, BLM, N MFS, CCC, CDFG, CT, SCHR, EII, TCFT, VC	Levees and Channelization	1, 4	2B	20	4217625	4217625	4217625	4217625	0	16870500
VenR-SCS-7.3	Develop and implement plan to vegetate levees and eliminate or minimize herbicide use near levees	FEMA, USGS, ACOE, BLM, NMFS, CT, SCHR, EII, TCFT, VC	Levees and Channelization	1, 4	2B	100	0	0	0	0	0	0
VenR-SCS-8.1	Review and modify mining operations	USGS, NMFS, USFWS, CDFG, CDMG, CT, SCHR, EII, TCFT, VC	Mining and Quarrying	1, 4, 5	3B	5	68030	0	0	0	0	68030
VenR-SCS-9.1	Develop and implement a non- native species monitoring program	CDFG, NMFS, CT, SCHR, EII, TCFT, VC	Non-Native Species	1, 3, 5	2B	100–refer to regional costs	0	0	0	0	0	0
VenR-SCS-9.2	Develop and implement watershed-wide plan to assess the impacts of non- native species and develop control measures	CDFG, USFW, NMFS, CDFG, CT, SCHR, EII, TCFT, VC	Non-Native Species	1, 3, 5	2B	100–refer to regional costs	0	0	0	0	0	0
VenR-SCS-9.3	Develop and implement public education program on non-native species impacts	CDFG, USFWS, NMFS, CT, SCHR, EII, TCFT, VC	Non-Native Species	1, 3, 5	2B	20	76140	76140	76140	76140	0	304560
VenR-SCS-10.1	Review and modify development and management plans for recreational areas and national forests	USFS, USFWS, NMFS, CDFG, CCC, NMFS, BLM, CT, SCHR, EII, TCFT, VC	Recreational Facilities	1, 2, 3, 4, 5	1B	ongoing–cost of doing business	0	0	0	0	0	0
VenR-SCS-10.2	Develop and implement a public education program on watershed processes	NRCS, USFS, USFWS, NMFS, CDFG, CT, SCHR, EII, TCFT, VC	Recreational Facilities	1, 3, 5	2B	20	76140	76140	76140	76140	0	304560
VenR-SCS-10.3	Review and modify development and management plans for recreational areas and national forests (e.g., U.S. Forest Service Los Padres National Forest Land Management Plan, Southern California National Forest Vision, Forest Strategy, and Design Criteria	USFS, USFWS, CDPR, CDFG, CT, SCHR, EII, TCFT, VC	Recreational Facilities	1, 2, 3, 4, 5	2B	ongoing–cost of doing business	0	0	0	0	0	0

Table 4.4.12.1 Southern California Steelhead DPS Recovery Action Table for Ventura River Sub-Watersheds (Monte Arido Highlands BPG) *(continued)*

Action#	Recovery Action	Potential Collaborators	Threat Source	Listing Factors (1 - 5)	Action Rank (1A, 1B, 2A, 2B,3A, 3B)	Task Duration	Estimated Costs ($)					
							FY 1–5	FY 6–10	FY 11–15	FY 16–20	FY 21–25	FY 1–100
VenR-SCS-10.4	Review and modify development and management plans for recreational areas and national forests	USFS, USFWS, BLM, NMFS, CDFG, OVLC, CT, SCHR, EII, TCFT, VC	Recreational Facilities	1, 2, 3, 4, 5	2B	5	62400	0	0	0	0	62400
VenR-SCS-11.1	Manage roadways and adjacent riparian corridor and restore abandoned roadways	USDOT, USFWS, NRCS, NMFS, CDOT, CDFG, CT, SCHR, EII, TCFT, VC	Roads	1, 4	2B	20–refer to regional costs	0	0	0	0	0	0
VenR-SCS-11.2	Retrofit storm drains to filter runoff from roadways	NRCS, NMFS, U SDOT, USFS, USFWS, CDOT, CDFG, CT, SCHR, EII, TCFT, VC	Roads	1, 4	2B	20	32260	32260	32260	32260	0	129040
VenR-SCS-12.1	Review and modify applicable County and/or City Local Coastal Plans	CCC, CDFG, NMFS, USFWS, CT, SCHR, EII, TCFT, VC	Upslope/ Upstream activities	1, 2, 3, 4, 5	2B	5	312000	0	0	0	0	312000
VenR-SCS-12.2	Develop and implement an estuary restoration and management plan	USFWS, NMFS, CDFG, CCC, AC, BLM, USFS, CT, SCHR, EII, T CFT, VC	Upslope/ Upstream activities	1, 2, 3, 4, 5	1B	5	4606250	0	0	0	0	4606250
VenR-SCS-13.1	Develop, adopt, and implement urban land-use planning policies and standards	NMFS, CDFG, CT, SCHR, EII, TCFT, VC	Urban Development	1, 4	2B	5	62400	0	0	0	0	62400
VenR-SCS-13.2	Develop, adopt, and implement urban land-use planning policies and standards	NMFS, CDFG, CT, SCHR, EII, TCFT, VC	Urban Development	1, 4	2B	5	62400	0	0	0	0	62400
VenR-SCS-13.3	Retrofit storm drains in developed areas	NMFS, USDOT, CDOT, CDFG, RWQCB, CT, SCHR, EII, TCFT, VC	Urban Development	1, 4	2B	20	0	0	0	0	0	0
VenR-SCS-14.1	Review California Regional Water Quality Control Board Watershed Plans and modify Stormwater Permits	RWQCB, NMFS, SWRCB, CDFG, CT, SCHR, EII, TCFT, VC	Urban Effluents	1, 4	2B	ongoing–cost of doing business	0	0	0	0	0	0
VenR-SCS-14.2	Review, assess and modify if necessary all NPDES wastewater discharge permits (e.g., Ojai Valley Sanitary District Wastewater Treatment Facility)	RWQCB, USFWS, NMFS, CDFG, CT, SCHR, EII, TCFT, VC	Urban Effluents	1, 4	2B	ongoing–cost of doing business	0	0	0	0	0	0
VenR-SCS-15.1	Develop and implement an integrated wildland fire and hazardous fuels management plan	USFS, NMFS, USGS, CDFG, LPFW, CT, SCHR, EII, TCFT, VC	Wildfires	1, 4, 5	1B	100—refer to regional costs	0	0	0	0	0	0

Appendix 4.4.13 Summary of Historical Fish Stocking

The following summary of historical fish stocking in the watershed is excerpted from the Draft Ventura River Habitat Conservation Plan *(Entrix & URS 2004).*

Rainbow trout were stocked in the Ventura River basin as early as 1878. Various nonnative strains have been stocked into the headwaters and mainstem of Ventura River, and continue to be stocked today. This stocking may have had an influence on the number of fish returning to spawn and the number of resident fish captured above barriers each year. Genetic analysis indicates that the rainbow trout found in the headwater streams of the Ventura River Basin are dominated by fish with a more widespread (not specific to southern California) mitochondrial DNA type.

The USFS has documentation of New Hampshire rainbow trout and Maine Salmon stocking in the basin in February 1878 (Chubb 1997). In 1894, 20,000 eastern brook trout, 10,000 rainbow trout, and 15,000 Tahoe trout were planted in the Ventura River headwaters (Chubb 1997). The following year, 62,500 rainbow trout were planted in Ventura County streams (Chubb 1997). Titus et al. (in press) reported that 40,000 and 34,000 steelhead juveniles were stocked in the Ventura River watershed in 1930 and 1931, respectively. The mainstem of the Ventura River was stocked with one to several thousand rainbow trout several times per year between 1942 and 1947 and between 1954 and 1974 (CDFG fish planting receipts). These fish were from several strains including Mount Whitney, Mount Shasta, and Hot Creek. The Ventura River was also stocked with steelhead rescued from the Santa Ynez River: approximately 17,200 in 1943; 20,800 in 1944; and 45,440 in 1945 (Titus et al. 1994). More recently, the mainstem Ventura River was stocked with 11,000 steelhead in June 1976, 9,000 steelhead in June 1977, and 20,000 steelhead in June 1978. All of these fish were released as young-of-the-year and were obtained primarily from Mad River hatchery (2,000 of the 1977 fish were from Humboldt State University Hatchery) (Moore 1980).

As on the mainstem of the Ventura River, thousands of juvenile rainbow trout from both Mount Whitney and Mount Shasta were stocked in Matilija Creek between 1938 and 1948 (CDFG fish planting receipts). The Upper North Fork Matilija Creek was stocked with 4,800 rainbow trout from Mount Shasta in 1948. Murietta Creek (West Fork Matilija Creek) was stocked twice in 1942 with 1,200 rainbow trout from Hot Creek and 1,800 rainbow trout from unspecified origin. The North Fork

Matilija Creek was reportedly stocked annually with trout of unspecified origin at least until 1973 (Commission 1973). Stocking of catchable-size trout continues in the North Fork Matilija Creek today.

Both steelhead and rainbow trout strains were stocked in the San Antonio Creek subbasin between 1933 and 1947 (CDFG fish planting receipts). Approximately 26,000 steelhead trout from Mount Whitney were stocked in San Antonio Creek between 1933 and 1940. Another 16,250 rainbow trout from Mount Whitney, Mount Shasta, and Hot Creek were stocked in San Antonio Creek between 1943 and 1947. There is one record of 10,000 rainbow trout from Mount Shasta stocked in Senior Canyon Creek, a tributary to San Antonio Creek, in 1945.

There is an additional stocking record from 1940 of approximately 2,500 rainbow trout of unspecified origin being stocked into Santa Ana Creek, a tributary to Coyote Creek (CDFG fish planting receipt).

In the past 40 or so years, regular stocking of rainbow trout strain from Mount Whitney, Coleman, and Hot Creek has occurred in Matilija Creek upstream of Matilija Dam and in North Fork Matilija Creek (M. Cardenas, CDFG, pers. comm.). During this time, a few isolated instances of stocking of steelhead strain from Mad River may have occurred. These stockings generally took place several times a year and contained both fingerling and catchable-size trout. Stocking of Matilija Creek upstream of Matilija Dam has continued through 1997.

Appendix 4.4.14 Other Local Water- and Watershed-Related Plans

Below is a summary of other local water- or watershed-related plans that have bearing on Ventura River watershed planning and management. These plans have been developed by public agencies, water and wastewater managers, or land and resource managers.

4.4.14.1 General

Integrated Regional Water Management Plan (IRWMP)

Organization: Watersheds Coalition of Ventura County

IRWMPs are regional plans designed to improve collaboration and integration in water resources management. IRWMP plan development was originally funded through grant programs created by Proposition 50 and, later, by Proposition 84. They are funded by grants from the California Department of Water Resources (DWR), and developed in accordance with DWR requirements. Projects included in IRWMPs become eligible for bond (e.g., Proposition 84) funding from the state.

Ventura County is a "region" for the purposes of IRWM planning. The first Ventura County IRWMP was produced in 2006 following a multi-year effort among water suppliers, wastewater agencies, stormwater and flood managers, watershed groups, the business community, agriculture and nonprofit stakeholders. An update to the 2006 plan was completed in 2014. The IRWMP and associated coordination efforts have resulted in $43 million in grant money for Ventura County water-related projects since 2006.

City and County General Plans

Organizations: County of Ventura, City of Ventura, City of Ojai

Local jurisdictions are required by the State of California to prepare and update general plans, which provide the local government's long-term blueprint for development and land use. General plans of the watershed's three local governments—Ventura County, City of Ventura, and City of Ojai—are applicable to the watershed. General plans must address certain elements, including land use, circulation, housing, conservation, open space, noise, and safety; and they generally include the equivalent of goals, policies, and programs for each of these elements.

General plans developed by local jurisdictions within the watershed include many policies that influence watershed issues, including water conservation, groundwater management, flood control, open space protection, protection of wetlands and significant biological resources, agricultural preservation, water-related infrastructure, parks and recreation, fire protection and risk management, and more.

The "vision" of general plans is implemented through the jurisdiction's zoning ordinance (sometimes called development code). General plans and zoning ordinances complement one another and must be compatible.

4.4.14.2 Water Supply

Urban Water Management Plans, 2010

Organizations: Casitas Municipal Water District, City of Ventura, Golden State Water

Urban water management plans (UWMP) are comprehensive, long-term plans developed to ensure adequate water supplies are available to meet existing and future water demands.

Every urban water supplier in California that provides over 3,000 acre-feet of water annually or serves more than 3,000 connections is required to submit an UWMP to the state. UWMPs must detail supply and demand projections for the next 20 years, and describe strategies to assure adequate supplies during average, single-year, and multi-year drought conditions. UWMPs also contain plans to implement a 20% reduction in per capita urban water use by the year 2020, as required under the Water Conservation Act of 2009. UWMPs must be updated every 5 years.

Three UWMPs are applicable to the watershed: Casitas Municipal Water District, City of Ventura, and Golden State Water.

Groundwater Management Plan, 2007

Organization: Ojai Basin Groundwater Management Agency

The first and only groundwater management plan in the watershed was originally adopted in 1995 by the Ojai Basin Groundwater Management Agency (OBGMA). An update was prepared in 2007. The OBGMA is required by law to have a groundwater management plan to guide its operations. The plan includes 5 broad goals and a number of action elements.

Water Efficiency Plan, 2011

Organization: City of Ventura

The City of Ventura developed its Water Efficiency Plan to develop strategies to buffer the city from impacts from water supply reductions—such as from extended drought, environmental restrictions, groundwater quality limitations, or litigation actions—and to improve the water reduction targets already attained.

Comprehensive Water Resources Report, 2013 and 2014

Organization: City of Ventura

The City of Ventura understands that monitoring its water supply and demand is essential to planning for and managing a stable and reliable water system to support its community and economic growth. The available water supply and demands upon it dramatically influences the City's planning for, development of, and investment in capital improvements to maintain current water supplies and develop new supplies. The preparation of this annual report, which started in 2013, serves as an update of the City's projected water supply and demand.

4.4.14.3 Water Quality

Basin Plan

Organization: Regional Water Quality Control Board, Los Angeles

Each of the California's nine water quality control regions has developed regional water quality control plans to address water quality issues specific to that region. The Ventura River watershed is under the jurisdiction of the Los Angeles Regional Water Quality Control Board (RWQCB).

The RWQCB's water quality control plan, called the Basin Plan, was last completely updated in 1994 and is periodically amended as new water quality objectives and TMDLs (Total Maximum Daily Load) regulations are adopted. The Basin Plan revolves around a concept called "beneficial uses." These are the resources, services, and qualities of aquatic systems that the regulations aim to protect. Examples of beneficial uses include water supply; recreation; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources. Beneficial uses can be existing, potential, or intermittent uses. Once beneficial uses have been designated for various waterbodies, appropriate water quality objectives can then be developed to protect those uses.

Stormwater Management Plans

Organization: Ventura Countywide Stormwater Quality Management Program

Stormwater management planning is addressed within Ventura County's MS4 permit and the associated Technical Guidance Manual and Hydromodification Control Plan, developed to implement some of the MS4 permit requirements related to new development and redevelopment.

4.4.14.4 Flood Management

Flood Mitigation Plan, 2005

Organization: Ventura County Watershed Protection District

The Ventura County Flood Mitigation Plan addresses planning for risks associated with flooding, post-fire debris flow, and dam failure. Flood hazards are identified and profiled, assets are identified, and vulnerability as well as capability is assessed. A mitigation strategy for reducing potential hazards, including goals, objectives, and actions, is also included.

4.4.14.5 Resource Management/Ecosystem Protection

Coastal Regional Sediment Management Plan, Central Coast from Pt. Conception to Pt. Mugu, 2009

Organization: BEACON

The Beach Erosion Authority for Clean Oceans and Nourishment (BEACON) is a Joint Powers Authority composed of Santa Barbara and Ventura counties and the six cities of Goleta, Santa Barbara, Carpinteria, Ventura, Oxnard, and Port Hueneme.

Coastal Regional Sediment Management Plans (CRSMP) are part of a larger, statewide effort to address sediment management by the Coastal Sediment Management Workgroup—a collaborative task force of state, federal, and local/regional entities concerned about the adverse impacts of coastal erosion on coastal habitats.

BEACON's CRSMP is intended to develop comprehensive strategies and practices to better conserve and restore the valuable sediment resources along its coastline; to reduce shoreline erosion and coastal storm damages; protect sensitive environmental resources; increase natural sediment supply to the coast; preserve and enhance beaches; improve water quality along the shoreline; and optimize the beneficial use of material dredged from ports, harbors, and other opportunistic sediment sources.

Lake Casitas Resource Management Plan

Organization: US Bureau of Reclamation, in cooperation with Casitas Municipal Water District

The Bureau of Reclamation in cooperation with Casitas Municipal Water District (CMWD) developed the Lake Casitas Resource Management Plan (RMP) to establish management objectives, guidelines, and actions for the Lake Casitas Recreation Area (LCRA) and the 3,500 acres of open space lands north of the LCRA, which together comprise the Plan Area.

The RMP is a long-term plan intended to guide actions in the Plan Area, and is based on a comprehensive inventory of environmental resources and facilities and input from local, state, and federal agencies; CMWD; and the general public. The primary emphasis of the RMP is to protect water quality, water supply, and natural resources, while enhancing recreational uses at the LCRA. Recreational uses must be compatible with the primary obligation to operate the reservoir for storage and delivery of high-quality water.

The Bureau of Reclamation's mission statement declares that it is "to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public." Planning, through Resource Management Plans, provides specific direction for Reclamation to accomplish its mission at water resource development projects.

Los Padres National Forest, Land Management Plan

Organization: US Forest Service, Pacific Southwest Region

The legislative mandate for the management of national forests requires that public lands be conservatively used and managed in order to ensure their sustainability and to guarantee that future generations will continue to benefit from their many values.

The land management plan for the Los Padres National Forest describes the strategic direction at the broad program-level for managing the land and its resources over the next 10 to 15 years, and in a way that assures the coordination of multiple uses (e.g., recreation and environmental education opportunities; forest health and management; air, soil, and water quality; watershed; and wildlife) and the sustained yield of products and services.

The land management plan also includes monitoring and evaluation requirements that provide a framework for ensuring US Forest Service programs and projects are meeting land management plan direction, and that desired conditions will be achieved over time.

City of Ojai Urban Watershed Assessment and Restoration Plan

Organization: City of Ojai

The City of Ojai Urban Watershed Assessment and Restoration Plan is a comprehensive assessment and restoration plan for the subwatersheds that drain through Ojai's city limits. These subwatersheds include Stewart Canyon, Fox Canyon, and portions of San Antonio and Thacher Creeks. Thacher, Stewart Canyon, and Fox Canyon creeks are all tributaries to San Antonio Creek, which is a major tributary to the Ventura River.

The primary purposes of the assessment and restoration plan are to identify specific problems of the Ojai creeks relevant to southern California steelhead, and develop a plan to restore fish habitat while addressing land use issues that adversely affect that habitat and the ecological health of the watersheds.

Southern California Steelhead Recovery Plan, 2012

Organization: National Marine Fisheries Service

The federal Endangered Species Act (ESA) mandates that the National Marine Fisheries Service (NMFS) develop and implement recovery plans for the conservation (recovery) of listed species. Recovery plans identify recovery actions, based upon the best scientific and commercial data available, necessary for the protection and recovery of listed species. Recovery plans published by NMFS are guidance documents, not regulatory documents.

Steelhead in southern California comprise a "distinct population segment" (DPS) of the species *O. mykiss* that is ecologically discrete from the other populations of *O. mykiss* along the West Coast of North America. Under the ESA, this DPS qualifies for protection as a separate species.

Ventura River Steelhead Restoration and Recovery Plan, 1997

Organizations: Casitas MWD, City of Ventura, Ventura County Flood Control District, Ventura County Transportation Department, Ventura County Solid Waste Management Department, Ojai Valley Sanitation District, Ventura River County Water District, Ojai Basin Ground Water Management Agency, Meiners Oaks MWD, and Southern California Water Company

In August 1997, the National Marine Fisheries Service (NMFS) listed anadromous steelhead in southern California as endangered under the Endangered Species Act (ESA). This listing means that any project or action that may affect southern California steelhead or their habitats

requires consultation with NMFS to obtain an incidental "take" permit. Since operation and maintenance of water diversions, river and stream channels managed for flood control purposes, transportation facilities, and sewage treatment plants may affect steelhead in the Ventura River, project operators are required to consult with NMFS to obtain permits.

To assist them in addressing steelhead issues and possible permit requirements, a group of local public and private agencies with responsibilities for surface water, ground water, flood control, and other public works facilities collaborated to develop this management plan to be used by these local agencies. The plan considers a wide range of conservation actions that can be implemented by public agencies with facilities and interests in the watershed, as well as other interested individuals, groups, or resource agencies.

Ventura County Oak Woodland Management Plan, 2007

Organization: Ventura County Planning Division

The development of Oak Woodland Management Plans (OWMP) grew out of the California Oak Woodland Conservation Act. As a result of the act, the Oak Woodland Conservation Program was established, which is designed to provide funding to help protect and enhance oak woodland resources. Projects in counties that have an Oak Woodland Management Plan are eligible for funding.

Ventura County's OWMP provides a conservation framework for the preservation of the county's oak woodland resources. The plan provides a summary of the distribution and extent of county's oak woodlands and outlines conservation goals and program recommendations.

4.4.14.6 Public Access Plans

Vision Plan for the Lower Ventura River Parkway

Organizations: Trust for Public Land and California State Coastal Conservancy

The Vision Plan for the Lower Ventura River Parkway (Vision Plan) was created by the 606 Studio, a consortium of faculty and graduate students in the Department of Landscape Architecture at California State Polytechnic University, Pomona; and was sponsored by The Trust for Public Land, Ventura Hillsides Conservancy, and the California Coastal Conservancy.

Although not an adopted plan, this document is important to many stakeholders in the watershed as offering a vision for a river parkway along the lower six miles of the Ventura River. The plan is intended as

an analysis, planning, and design tool for governmental and non-governmental agencies, and the surrounding community. The plan's ideas are aimed at helping in the creation of a river parkway that is compatible with recreational use, stewardship, river function, and regional ecosystems.

4.4.14.7 Hazard/Emergency Response Plans

Multi-Jurisdictional Hazard Mitigation Plan for Ventura County

Organization: County of Ventura

The Multi-Jurisdictional Hazard Mitigation Plan for Ventura County (HMP) was prepared to meet the Department of Homeland Security's Federal Emergency Management Agency (FEMA) requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) (DMA 2000) and Interim Final Rule (the Rule). The Rule establishes the minimum hazard mitigation planning requirements for states, tribes, and local entities.

Participating organizations include eight local jurisdictions in the county, along with 20 school districts, the Ventura County Superintendent of Schools Office, two water districts, Ventura County Fire Protection District, the Watershed Protection District, and the Ojai Valley Sanitary Districts.

By preparing the HMP, all 34 participants are eligible to receive federal mitigation funding after disasters and to apply for mitigation grants before disasters strike.

The plan is intended to enhance public awareness and understanding, create a decision tool for management, promote compliance with state and federal program requirements, enhance local policies for hazard mitigation capability, provide inter-jurisdictional coordination of mitigation-related programming, and achieve regulatory compliance.

Emergency Response Plans, Public Drinking Water Systems

Organization: All water districts with 5 or more connections.

All water suppliers with 5 or more connections are required to have an Emergency Response Plan. These are comprehensive plans that describe the actions the water supplier would take in response to various major events such as natural disasters or security problems that could damage or disrupt the ability to serve the public potable water.

Ventura County Community Wildfire Protection Plan

Organization: Ventura County Fire Protection District

The Healthy Forest Restoration Act (HFRA) enacted by the US Congress on Jan 7, 2003, established a protocol for the creation of wildfire safety plans for communities at risk from wildland fires—a Community Wildfire Protection Plan (CWPP).

The Ventura County CWPP identifies wildfire risks, clarifies priorities for funding, and describes programs to reduce impacts of wildfire on the communities at risk within Ventura County.

Unit Strategic Fire Plan

Organization: Ventura County Fire Protection District

The Unit Strategic Fire Plan identifies and prioritizes pre-fire and post-fire management strategies and tactics meant to reduce the loss of values at risk within the unit (Ventura County Fire Protection District).

The overall goal is to reduce total cost and losses from wildland fire in Ventura County by protecting assets at risk through focused pre-fire management prescriptions and increased initial attack success.

4.4.14.8 Watershed Management Plans (surrounding watersheds)

Watershed management plans of surrounding watersheds are relevant to the Ventura River watershed's planning effort. Surrounding plans include the following:

Rincon Creek Watershed Plan

Calleguas Creek Watershed Management Plan (Volumes I and II)

Santa Clara River Enhancement & Management Plan