

# Cholame Creek Watershed

Hydrologic Unit Name	Water Planning Area	Acreage	Flows to	Groundwater Basin(s)	Jurisdictions
Estrella 17	Cholame WPA 15	151,701 acres total with 47,300 acres in San Luis Obispo County	Estrella River– to Salinas River and Pacific Ocean (Monterey bay National Marine Sanctuary)	Paso Robles	County of San Luis Obispo, Shandon (ptn)



Photo: Althouse and Meade

### **Description:**

The Cholame Watershed is located in the North easterly portion of San Luis Obispo County and crosses the county line entering Monterey County to the North. 47,300 acres of the total 151,701 acres are located in SLO County. The watershed is drained by Cholame Creek and its tributaries southeastward and westward into the Estrella River (a tributary to the Salinas River) with the confluence of the Estrella River and Cholame Creek occurring at the town of Shandon. The Cholame Creek watershed is a lightly-populated rural setting and drains into an alluvial valley and surrounding mountains within an ecosystem characterized of grassland, chaparral, oak woodland, and sagebrush and minor amounts of cropland, primarily consisting of grain or hay crops. The dominant land use is agriculture. The area around Shandon Valley is generally used most intensively for agriculture because of better soils and water availability. Irrigated production has increased during the last 10 years, particularly in vineyards and alfalfa. Dry farming and grazing operations encompass the rest of the agricultural uses. The highest watershed elevation within the County limits is at approximately 2,476-feet with the lowest elevation occurring at approximately 1,017-feet. The watershed's headwaters are in Diablo Range in Monterey County.



### **Existing Watershed Plans:**

No existing plans to date

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## Characteristics

	Physical Setting	
Green	Rainfall	Average Annual: 11-14 in. (NRCS shapefile, 2010)
Yellow	Air Temperature	Summer Range (August 1990-2012): 53°-96°F Winter Range (December 1990-2012): 32°-60°F (Parkfield, not in Watershed, NOAA National Climatic Data Center, viewed 2013)
Green	Geology Description	<p>Hopper Canyon and Palo Prieto Canyon sub-watersheds are composed of flat highly infiltrative Quaternary material.</p> <p>Cholame Valley sub-watershed is moderate steep moderately infiltrative early to mid-Tertiary headwaters with flat highly infiltrative Quaternary inland.</p> <p>Blue Point and Red Rock Canyon are steep moderately infiltrative early to mid-Tertiary geologic materials (Bell, pers. comm., 2013).</p> <p>Groundwater is found in Holocene age alluvium and the Pleistocene age Paso Robles Formation. Specific yield values in the Paso Robles Sub-basin range from 7 to 11 percent, with an average specific yield of 9 percent. DWR (1958) estimated the average specific yield for the sub-basin at 8 percent. DWR (1999) estimated the average specific yield at 15 percent for the alluvium and 9 percent for the Paso Robles Formation. Alluvium. Holocene age alluvium consists of unconsolidated, fine- to coarse-grained sand with pebbles and boulders. This alluvium provides limited amounts of groundwater and reaches 130 feet thick near the Salinas River, but is generally less than 30 feet thick in the minor stream valleys (DWR 1999). Its high permeability results in a well production capability that often exceeds 1,000 gallons per minute. Groundwater in Holocene alluvium is mostly unconfined. The Pleistocene age Paso Robles Formation, which is the most important source of groundwater in the sub-basin, is unconsolidated, poorly sorted, and consists of sand, silt, gravel, and clay. This formation reaches a thickness of 2,000 feet and groundwater within it is generally confined (Chipping 1987).</p> <p>The Rinconada fault zone forms a leaky barrier that restricts flow from the Atascadero portion of the sub-basin to the main part of the Paso Robles Sub-basin (Fugro West 2001a). The San Andreas fault restricts subsurface flow (Ca. Dept. of Water Resources, 2003).</p>

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	Hydrology	
	Stream Gage	Yes; USGS 11147800 (Cholame Creek near Highway 41)(USGS, viewed August 2013) <i>Last data recorded in 1973</i>
	Hydrology Models	Yes; CCRWQCB. 2011. Synthetic flow record to determine Pathogen TMDL; SLO County Flood Control and Water Conservation District, 2008, Paso Robles Groundwater Sub-basin Water Banking Feasibility Study. <i>Limited Information for Cholame Valley Basin, Study area is Paso Sub-basin as a whole</i>
	Peak Flow	750 cfs (USGS, 1959-73) (USGS, viewed August 2013).
	Base Flow	5.79 cfs (USGS, 1959-1972) (USGS, viewed August 2013).
	Flood Reports	No source identified
	Flood Control Structures	Bridges: 2 over Cholame Creek on Cholame Valley Road and N. Bitterwater Road (PWD Bridges GIS Layer)
	Areas of Flood Risk	No data available
	Biological Setting	
	Vegetation Cover	Primarily non-native annual grassland with cropland, blue oak-foothill pine consisting mainly of blue oak, coastal scrub consisting mainly of California sagebrush, montane hardwood consisting mainly of oak (SLO County vegetation shapefile, 1990). <i>Data limited by age of shapefile</i>  Wetlands, perennial grasslands, and riparian woodland are also present in this watershed (Althouse and Meade, 2013).  There is a great diversity of plant communities including Central Coast Scrub, Serpentine Scrub, Coast Live Oak Woodland, and Central Coast Cottonwood-Sycamore Riparian Forest in addition to vast areas of non-native grassland. (U.S. Department of Transportation, 2006) <i>Data limited to observations, not complete inventory</i>
	Invasive Species	Invasive species known to occur in this watershed include: Tree of Heaven ( <i>Ailanthus altissima</i> ), Tamarisk ( <i>Tamarix spp.</i> ), Russian knapweed ( <i>Acroptilon repens</i> ), Russian thistle ( <i>Salsola tragus</i> ) (Althouse and Mead, 2013). <i>Data limited to observations, not complete inventory</i>
	Special Status Wildlife and Plants	Key: FE - Federal endangered, FT - Federal threatened, SE - State endangered, ST - State threatened, SSC - State Species of Special Concern; FP- Fully Protected, SA – Special Animal, CRPR – CA rare plant rank (CNDDDB, viewed August, 2013)  Locations listed refer to USGS 7.5' quadrangle names. Only the portion overlapping the watershed boundary was considered.

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Data limited to observations, not complete inventory

Special Status Species	Status	CHOLAME	CHOLAME HILLS	CHOLAME VALLEY	CURRY MOUNTAIN	GARZA PEAK	ORCHARD PEAK	PARKFIELD	SMITH MOUNTAIN	STOCKDALE MTN	TENT HILLS	THE DARK HOLE
<b>Animals</b>												
<i>American badger</i>	SSC	x										x
<i>bank swallow</i>	ST	x										
<i>burrowing owl</i>	SSC (Burrow sites, some wintering sites)	x					x					
<i>California red-legged frog</i>	FT						x				x	
<i>California tiger salamander</i>	FT; ST		x	x			x					
<i>coast horned lizard</i>	SSC	x		x			x					
<i>giant kangaroo rat</i>	FE; SE	x										
<i>grasshopper sparrow</i>	SSC (Nesting)	x										
<i>mountain plover</i>	SSC (Wintering)	x		x								
<i>Nelson's antelope squirrel</i>	ST											x
<i>pallid bat</i>	SSC	x	x		x		x	x		x		
<i>prairie falcon</i>	SA (Nesting)	x	x	x	x	x	x	x	x	x	x	x
<i>San Joaquin kit fox</i>	FE; ST	x		x								
<i>San Joaquin whipsnake</i>	SSC	x										
<i>silvery legless lizard</i>	SSC	x										
<i>Tulare grasshopper mouse</i>	SSC	x					x					
<i>western pond turtle</i>	SSC	x						x				
<i>western spadefoot</i>	SSC		x	x			x					
<b>Plants</b>												
<i>delicate bluecup</i>	CRPR 1B.3											x
<i>Eastwood's buckwheat</i>	CRPR 1B.3				x			x				
<i>Hall's tarplant</i>	CRPR 1B.1	x		x							x	x
<i>Hernandez spineflower</i>	CRPR 1B.2		x									
<i>Indian Valley bush-mallow</i>	CRPR 1B.2											x
<i>Lemmon's jewel-flower</i>	CRPR 1B.2	x					x					x

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Species	Status	CHOLAME	CHOLAME HILLS	CHOLAME VALLEY	CURRY MOUNTAIN	GARZA PEAK	ORCHARD PEAK	PARKFIELD	SMITH MOUNTAIN	STOCKDALE MTN	TENT HILLS	THE DARK HOLE
<i>Mason's neststraw</i>	CRPR 1B.1	x	x									
<i>Munz's tidy-tips</i>	CRPR 1B.2	x										
<i>oval-leaved snapdragon</i>	CRPR 4.2	x	x				x				x	
<i>pale-yellow layia</i>	CRPR 1B.1			x			x				x	
<i>Panoche pepper-grass</i>	CRPR 1B.2						x					
<i>round-leaved filaree</i>	CRPR 1B.1	x										
<i>shining navarretia</i>	CRPR 1B.2	x										
<i>showy golden madia</i>	CRPR 1B.1	x	x				x				x	x
<i>straight-awned spineflower</i>	CRPR 1B.3	x										
<i>Temblor buckwheat</i>	CRPR 1B.2						x	x			x	
Steelhead Streams	None (CNDDDB Database. Viewed 2013)											
Stream Habitat Inventory	No source identified											
Fish Passage Barriers	None (PAD Database viewed 2013)											
Designated Critical Habitat	Yes; California Red-legged Frog, California Tiger Salamander Area (USFWS Critical Habitat Portal, viewed 2013)											
Habitat Conservation Plans	Yes; North San Luis Obispo County Habitat Conservation Program, multiple species <i>HCP for North County as a whole, not watershed specific</i>											
Other Environmental Resources	Paso Robles Groundwater Basin (SLO County Flood Control and Water Conservation District, 2007)											
<b>Land Use</b>												
Jurisdictions & Local Communities	County of San Luis Obispo, Shandon											
% Urbanized	1.4% (Commercial Service, Rural Residential, Rural Suburban, Rural Single Family) (SLO County LUC)											
% Agricultural	98.4%, (SLO County LUC)											
% Other	0%											
Planning Areas	Shandon – Carrizo Planning Area											
Potential growth areas	Shandon											

# Cholame Creek Watershed

	Facilities Present	None identified
	Commercial Uses	Agriculture
	<b>Demographics</b>	
	Population	74 in watershed (US Census Block, 2010)
	Race and Ethnicity	Watershed: 63.5% Caucasian; 35.1% Latino; 1.4% Other (US Census Block, 2010)  Shandon: 53.5% Latino; 41.1% Caucasian; 2.6% Black or African American; 0.9% American Indian and Alaska Native; 0.5% Asian; 0.2% Pacific Islander; 1.2% Mixed Race (US Census, 2010)
	Income	MHI \$66,966 in watershed (tract spans 6 watershed) (U.S. Census Tract, 2010). MHI \$65,260 in Shandon (US Census, 2010)
	Disadvantaged Communities	No; 4% of individuals below poverty level in watershed (U.S. Census Tract, 2010) (tract spans 6 watershed). 19.1% of individuals are below poverty level in Shandon (US Census, 2010)
	<b>Water Supply</b>	
	Water Management Entities	County Service Area (CSA) No. 16 (Shandon); outlying properties served by individual wells - Depths of wells ranged from 100 to 665 feet (Carollo, 2012)
	Groundwater	Yes; Paso Robles and Cholame Valley Basins  Cholame Basin: Subsurface groundwater inflow and outflow has been reported to occur through the Paso Robles Formation (Bader 1969)(Ca. Dept. of Water Resources, 2003).
	Surface Water	No public reservoirs.
	Imported Water	CSA 16 holds an allocation for 100 acre-feet per year (AFY) of the State Water Project supply. In order to use this allocation, a turn-out on the State Water Project, which runs north-south along the eastern edge of San Juan Road, would have to be built. (SLO County, 2012)
	Recycled/Desalinated Water	None
	Key groundwater percolation area(s)	No data on key areas identified  Natural recharge in the basin is derived from infiltration of precipitation, seepage from streams, and return flow from irrigation and other uses (Ca. Dept. of Water Resources, 2003)
	Water budget	Yes; Todd Engineers, 2013, for Paso Robles Groundwater Sub-basin Update

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	Water Uses	
	Beneficial Uses	<i>Cholame Valley</i> - Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Ground Water Recharge (GWR), Water Contact Recreation (REC-1), Non-Contact Water Recreation (REC-2), Wildlife Habitat (WILD), Warm Freshwater habitat (WARM), Threatened, or Endangered Species (RARE), and Commercial and Sport Fishing (COMM) (CCRWQCB, 2011)
	<b>Other Unique Characteristics</b>	
	Cholame Creek	Cholame Valley and the large alkali salt flat in the area offer unique habitat to specialized plant species. A unique natural community known as valley sink scrub exists in the watershed. Characterized by low, open succulent shrublands dominated by alkali tolerant plant species such as frankenia ( <i>Frankenia salina</i> ), spear oracle ( <i>Atriplex patula</i> ), wedge scale ( <i>Atriplex truncata</i> ), alkali weed ( <i>Cressa truxillensis</i> ) and saltgrass ( <i>Districhlis spicata</i> ). Valley scrub soil are typically dark, sticky clay soils that often have a brilliant white salty crust over them. Grazing has altered much of this community where non-native grasses now dominate much of the Cholame Valley floor.
	Palo Prieto Canyon	Located at an important crossroads for San Joaquin kit fox populations of the the Carrizo Plain, the Ciervo-Panoche, and the Salinas River Valley. Properties contain a natural lake (sag pond), Grant Lake, and numerous small vernal and seasonal ponds and pools. Wetlands support rare amphibians, crustaceans and flora. Sag ponds historically habitat for California tiger salamander, Western spadefoot toad and California toad.
	Shandon Vicinity Creek Area and Habitat Area	The riparian forest and a portion of the adjacent upland areas associated with the Estrella River and San Juan Creek in the vicinity of Shandon are important wildlife habitat for the San Joaquin kit fox, Western burrowing owl and other wildlife species, and serve as important corridors for wildlife movement. Another important wildlife movement corridor is located near the base of the hillside near the eastern edge of Shandon.
	<b>Climate Change Considerations</b>	
		See IRWMP, 2014 Section H, Climate Change <i>Data is general to County, not Watershed specific</i>

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## *Watershed Codes*

CalWater / DWR Number	HA	Hydrologic Area Name	HSA	Hydrologic Sub-Area Name	SWRCB Number	CDF Super Planning	CDF Watershed Name
3317.000903	0	Undefined	0	Undefined	317.00	Cholame	Blue Point
3317.000904	0	Undefined	0	Undefined	317.00	Cholame	Cholame Valley
3317.000503	0	Undefined	0	Undefined	317.00	Cholame	Hopper Canyon (ptn)
3317.000906	0	Undefined	0	Undefined	317.00	Cholame	Palo Prieto Canyon
3317.000902	0	Undefined	0	Undefined	317.00	Cholame	Red Rock Canyon
3317.000907	0	Undefined	0	Undefined	317.00	Cholame	West side Cholame Valley
3317.000905	0	Undefined	0	Undefined	317.00	Cholame	E. of Palo Prieto Canyon

Source: Excerpt from California Interagency Watershed Map of 1999, Calwater 2.2.1 (CA Resource Agency, 2004 Update)

## *Major Changes in the Watershed*

- Historic junction where different Native American tribes have met to trade goods from their respective areas. Coastal tribes met with valley tribes and tribes of the Sierra Nevada to exchange food, materials for tools and ceremonial pieces.
- The Migueleno people, a subset of the Salinan cultural group, were the native residents project area. Because of the early impact on them by Spanish colonization beginning in 1769, ethnographic data is limited.
- The Salinan people are believed to have occupied the region for at least several thousand years. Population figures suggest that their numbers probably never surpassed 3,000. The eastern boundary, which followed summit of the Diablo Range, appears to have been somewhat fluid and shared with bands of the Southern Valley Yokut.
- 1844 – Rancho Cholame established. A 26,622 acre Mexican land grant given by Governor Manuel Micheltorena to Mauricio Gonzales from the holdings of Mission San Miguel Arcangel.
- 1867 – William Welles Hollister (1818-1886) purchased Rancho Cholame, sells to Edgar Jack in 1869 who uses it mainly as a sheep range.
- Cholame has long been an area of activity and a place to congregate for residents of the area. A post office was first established there on May 14, 1873.

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- The Jack Ranch Café was built in 1923, serving locals and travelers alike. A clump of ailanthus (tree of heaven) trees marks the spot of the former Cholame-Orange schoolhouse.
- In November 1966, Howard Jack sold the 21,450 hectares (53,000 acres) Cholame Ranch to the Hearst Corp., which still owns and operates the Jack Ranch as it is commonly known.

## *Watershed Health by Major Tributary*

<b>Tributary Name</b>	<b>Ephemeral / Perennial</b>	<b>303d Listed/ TMDLs</b>	<b>Pollution Sources NP (non-point) MP (Major Point)</b>	<b>Environmental Flows</b>
Blue Point	Undetermined	Not assessed	Undetermined	Not assessed
Cholame Valley	Perennial	Yes; Boron, Chloride, Electrical Conductivity, Escherichia coli (E. coli), Fecal Coliform, Low Dissolved Oxygen, Sodium	Grazing Related sources, Natural Sources, Source Unknown	Not assessed
Hopper Canyon (ptn)	Undetermined	Not assessed	Undetermined	Not assessed
Palo Prieto Canyon	Undetermined	Not assessed	Undetermined	Not assessed
Red Rock Canyon	Undetermined	Not assessed	Undetermined	Not assessed

## *Watershed Health by Major Groundwater Basin*

<b>Groundwater Basin</b>	<b>Estimated Safe Yield</b>	<b>Water Availability Constraints (Carollo, 2012)</b>	<b>Drinking Water Standard Exceedance</b>	<b>Water Quality Objective Exceedance (CCRWQCB, 2011)</b>
Paso Robles	97,700 AF (SLO County, 2012)	Physical limitations, water rights and water quality	Yes; see description below.	None
Cholame Valley*	No data	Physical	None	None

# Cholame Creek Watershed

	available	limitations and water quality	
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*\*Last specific groundwater study in 1969.*

**Groundwater Quality Description:** The predominant cations in the watershed are calcium and sodium and the predominant anion is bicarbonate (DWR 1981; Fugro West 2001b). Analysis of 48 public supply wells in the sub-basin show an average Total Dissolved Solid (TDS) content of 614 ppm and a range of 346 to 1,670 ppm.

In one study (Fugro West 2001b), 23 of 74 samples collected exceeded one or more of the drinking water standards. The Maximum Contaminant Level (MCL) for TDS was exceeded in 14 samples (Fugro West 2001b). The MCL for nitrate was exceeded in 4 samples. The Bradley portion of the sub-basin had the highest percentage of samples with constituents higher than the drinking water standards (Fugro West, 2001b) Trends show an increasing concentration of nitrate between the Salinas and Huer Huero rivers south of San Miguel (Fugro West, 2001b; Carollo, 2012)

Generally high concentrations of TDS, chlorides, sulfates, and boron were identified for the Cholame Valley Basin (Chipping, et al., 1993).

## Primary Issues

<b>Issue</b>	<b>Potential Causes</b>	<b>Referenced from</b>
Significant water level declines	Range of groundwater uses in close proximity, including agricultural irrigation, municipal supply wells, golf course irrigation, and a relatively dense aggregation of rural “ranchette” users	Carollo, 2012
Limited groundwater quality information – Cholame Valley basin		Carollo, 2012
No yield information and limited hydrogeologic information for Cholame Basin		Carollo, 2012
Groundwater Quality	high concentrations of TDS, chlorides, sulfates, and boron	Carollo, 2012
Cholame Creek 303(d) listed for Boron, Chloride, Electrical Conductivity, Escherichia coli (E. coli), Fecal Coliform, Low Dissolved Oxygen, Sodium	Grazing Related sources, Natural Sources	Carollo, 2012

**Paso Robles Groundwater Basin:** According to multiple studies of this basin, annual basin pumping is now at or near the basin’s perennial yield (Paso Robles Groundwater Management Plan, 2011). From

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1997–2009, water levels declined on average of 2–6 feet per year, depending on the location. A Todd Engineering monitoring report (2007) indicated that the Basin was not approaching the safe yield level and some areas were experiencing significant declines in groundwater elevations. A later study completed in 2009 suggested groundwater pumping was approaching the safe yield level of the Basin. The 2010 Resource Capacity Study prepared by the San Luis Obispo County Planning Department stated that the Basin is now near or at perennial yield levels. The County Board of Supervisors certified a Level of Severity III for the Paso Robles Basin in October, 2012, due to declining water levels. In August 2013, the County Board of Supervisors adopted an urgency ordinance to limit new draws from the Paso Robles Groundwater basin.

The Paso Robles Groundwater Basin encompasses an area of approximately 790 square miles and is the primary, and in many places the only, source of water available to property owners throughout Northern San Luis Obispo County. The basin extends from the Garden Farms area south of Atascadero to San Ardo in Monterey County, and from the Highway 101 corridor east to Shandon. The basin supplies water for 29% of SLO County’s population and an estimated 40% of the agricultural production of the County (Paso Robles Groundwater Basin Blue Ribbon Committee, 2013).

Paso Robles, Atascadero, and Templeton draw their water from the groundwater basin (primarily the Atascadero sub-basin), the underflow of the Salinas River and from the Nacimiento Pipeline Project. The remaining communities (Shandon, San Miguel, Creston, Bradley, Camp Roberts, Whitley Gardens, and Garden Farms) are entirely dependent on the groundwater basin for their water supply.

An established bi-annual well monitoring program overseen by the SLO County Flood Control and Water Conservation District reported these water declines in groundwater dependent communities (Through April, 2013):

- a. Shandon: Water levels have dropped approximately 17 feet from 2011 to 2013.
- b. Creston: Water levels have dropped approximately 25 feet from 2011 to 2013.
- c. Estrella: Water levels have dropped approximately 25 feet from 2011 to 2013.
- d. San Juan: Water levels have dropped approximately 5 feet from 2012 to 2013.

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## ***Significant Studies in Progress:***

None identified