Big Creek – San Carpoforo Creek Area Watershed

Hydrologic Unit Name	Water Planning Area	Acreage	Flows to	Groundwater Basin(s)	Jurisdictions
Estero Bay 10	Cambria WPA 2	264,552 acres total 13,046 acres (within San Luis Obispo County)	Pacific Ocean at Monterey Bay National Marine Estuary	San Carpoforo Valley	County of San Luis Obispo

Description:

The Big Creek – San Carpoforo Creek Area Watershed straddles San Luis Obispo County and Monterey County with 13,046 acres out of 264,552 total acres within SLO County. This snapshot represents data related to those sub-watersheds located within the CalWater HUC 10 watershed grouping in San Luis Obispo County. The watershed lies along the Pacific Ocean with the southernmost outfall at Ragged Point, north of San Simeon. The most notable waterway within the San Luis Obispo portion of the watershed is San Carpoforo Creek, which has its headwaters in the Los Padres National Forest at the Santa Lucia Range in southern Monterey and Northern San Luis Obispo County. Pacific Ocean outfall of San Carpoforo Creek is designated as State Marine Conservation Area and State Marine Reserve within the Monterey Bay National Marine Sanctuary. Mt. Mars Creek also independently drains into the Pacific Ocean just north of the San Carpoforo Creek drainage. Peak elevation for the watershed is approximately 2610 feet high with the low being roughly 16 feet above sea level in Monterey County. A portion of the San Carpoforo Creek drainage is located within the boundaries of the Hearst Ranch property and is currently under the provisions of a conservation easement. The dominant land use is Los Padres National Forest and rangeland agriculture, with a majority of rangeland concentrated in the area of Hearst ranch. A rugged shoreline and mountainous eastern ridge characterize the northern portion of the watershed. The creek was the route of the historic Portola Expedition and was identified as an area of high ecological significance by the Forest Service.

Watershed Plans:

No existing plans to date

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Characteristics

	Physical Setting	
	Rainfall	Average Annual: 19 in. (coast) - 36 in. (mountains) (NRCS Shapefile, 2010)
	Air Temperature	Summer Range (August 2001-2012): 50°-77°F Winter Range (December 2001-2012): 44°-62°F (Big Sur, ncdc.noaa.gov)
	Geology Description	Steep Franciscan non-infiltrative headwaters (Bell, pers. comm., 2013). Mountains of the rugged Big Creek Watershed coastline notably rise to 5,000 foot summits within two miles of ocean in Monterey County, the most abrupt elevation change of the entire Pacific shore. Several hundred million years ago, river-borne sediments from a mountain range in what is now Mexico were deposited along the west coast. Layers of sandstone, siltstone and limestone were compressed and folded by the underriding of tectonic plates at the continent's edge. The sediments metamorphosed with pressure into schist, gneiss, granofels and marbles of the Franciscan Formation, now the oldest rocks in the Santa Lucia Range. By 65 million years ago this plate, called the Salinan Block, began to drift northward by plate tectonic movement. The block's progress was halted by Pacific Ocean crust and started a process of faulting and uplifting which continues today. Seismic activity is frequent along lateral faults that result in canyons running parallel to the coast instead of directly into it. Highest peaks are granitic rock, which are more resistant to erosion. Taller peaks may also be marble (metamorphosed limestone). Original sediments of sandstone and siltstone have been tilted up into cliffs in some areas (Chipping, 1987). The San Carpoforo Valley Groundwater Basin underlies San Carpoforo Valley in northwestern San Luis Obispo County. The basin is bounded on the west by the Pacific Ocean and on all other sides, by impermeable rocks of the Jurassic to Cretaceous age Franciscan Group (Ca Dept of Water Resources, 2003).
	Hydrology	
	Stream Gage	Yes; USGS 11142550, last recorded in 1978. (San Carpoforo Creek near Hwy 1)
	Hydrology Models	No source identified
	Peak Flow	14,200 cfs, 1978 (USGS, viewed August 2013)
	Base Flow	148.6 cfs, 1978 (USGS, viewed August 2013)

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	Flood Reports	No source identified
	Flood Control Structures	No data available
	Areas of Heightened Flood Risk	No data available
	Biological Setting	
	Vegetation Cover	Primarily coast live oak woodland, and mixed evergreen forest consisting of continuous coast live oak and California bay with some coastal redwood. Some coastal scrub, buckbrush chaparral, serpentine chaparral, and chamise chaparral, non-native annual grassland, intermittent ponderosa pine, and valley foothill riparian consisting of continuous coast live oak are present. (SLO County vegetation shapefile, 1990) Coastal redwood has limited distribution in San Luis Obispo County and is primarily found along the North Coast. *Data limited by age of shapefile available*
	Invasive Species	No data available
	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 (CNDDB, viewed August, 2013) Locations listed refer to USGS 7.5' quadrangle names. Only the portion overlapping the watershed boundary was considered. *Data limited to observations, not complete inventory*

Species	Status	BURNETT PEAK	BURRO MOUNTAIN	PIEDRAS BLANCAS	SAN SIMEON
Animals					
black swift	SSC		x		
foothill yellow-legged frog	SSC		x		
monarch butterfly	SA	x	x	x	x
prairie falcon	SA Nesting	x	x	x	x
Smith's blue butterfly	FE		x		
steelhead - south/central California coast DPS	FT		x		
western pond turtle	SSC		x		
Plants					
Brewer's spineflower	CRPR 1B.3		x		

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Species	Status	BURNETT PEAK	BURRO MOUNTAIN	PIEDRAS BLANCAS	SAN SIMEON
bristlecone fir	CRPR 1B.3	x	x		
Cone Peak bedstraw	CRPR 1B.3		x		
Cook's triteleia	CRPR 1B.3		x		
Hardham's bedstraw	CRPR 1B.3	x	x		
late-flowered mariposa-lily	CRPR 1B.2	x	x		
most beautiful jewel-flower	CRPR 1B.2		x		
Palmer's monardella	CRPR 1B.2		x		
San Luis Obispo sedge	CRPR 1B.2	x	x	x	x
Santa Lucia bedstraw	CRPR 1B.3		x		

Steelhead Streams	Yes; San Carpoforo Creek (Becker et. al, 2010) The California Department of Fish and Game considers the San Carpoforo Creek to be one of two of the most important spawning streams for threatened steelhead in San Luis Obispo County (Ventana Wilderness Alliance, 2007).
Stream Habitat Inventory	Yes; Department of Fish and Game, 1995 *Data limited by age of last inventory*
Fish Passage Barriers	None identified
Designated Critical Habitat	Yes; Steelhead Trout (USFWS Critical Habitat Mapper, viewed 2013)
Habitat Conservation Plans	None identified
Other Environmental Resources	San Luis Obispo Coastal Zone, Monterey Bay National Marine Sanctuary, Hearst Ranch Conservation Project (SLO County Flood Control and Water Conservation District, 2007)
Land Use	
Jurisdictions & Local Communities	County of San Luis Obispo
% Urbanized	0% (SLO County LUC)
% Agricultural	82% - 17.3 sq mi: rangeland (SLO County LUC)
% Other	1% recreation; 17% rural residential (SLO County LUC)
Planning Areas	North Coast Planning Area (SLO County)
Potential growth areas	None identified

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	Facilities Present	Hearst Ranch
	Commercial Uses	Ragged Point Inn and Resort, tourism, agriculture (livestock grazing)
	Demographics	
	Population	13 (US Census Block, 2010)
	Race and Ethnicity	Caucasian, representing 100%. (US Census Block, 2010)
	Income	MHI $51,557 (includes rural lands of coastal communities from northern SLO boundary to Morro Bay) (US Census Tracts, 2010)
	Disadvantaged Communities	No; 0% individuals below poverty (US Census Tracts, 2010)
	Water Supply	
	Water Management Entities	None identified for the portion of the watershed located within San Luis Obispo County – existing uses served by Individual wells
	Groundwater	Yes; Alluvial, San Carpoforo Valley Basin San Carpoforo Valley
	Surface Water	No public reservoirs in the watershed. Identified as fully appropriated stream system for entire year according to the SWRCB's Water Code 1205-1207.
	Imported Water	None
	Recycled/Desalinated Water	None
	Key groundwater percolation area(s)	No data on key areas identified Recharge to the basin is largely by percolation of stream flow and to a lesser extent from infiltration of precipitation and excess irrigation flow *(*Ca Dept. of Water Resources, 2003).
	Water budget	None to date
	Water Uses	
	Beneficial Uses	*San Carpoforo Creek* - Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Service Supply (IND), Ground Water Recharge (GWR), Water Contact Recreation (REC-1), Non-Contact Water Recreation (REC-2), Wildlife Habitat (WILD), Cold Fresh Water Habitat (COLD), Warm Freshwater habitat (WARM), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), Threatened, or Endangered Species (RARE), Freshwater Replenishment (FRESH), and Commercial and Sport Fishing (COMM). *Chris Flood Creek* - Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Groundwater Recharge (GRW), Water Contact

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		Recreation(REC-1), Noncontact Water Recreation(REC-2), Wildlife Habitat(WILD), Cold Freshwater Habitat(COLD), Warm Freshwater Habitat (WARM), and Commercial and Sport Fishing (COMM). (CCRWQCB, 2011)
	Other Unique Characteristics	
	Monterey Bay National Sanctuary	Flows south out of the Santa Lucia Range in the northern Los Padres National Forest, onto lands owned by the Hearst Corporation and then to the Pacific Ocean. Pacific Ocean outfall designated as State Marine Conservation Area and State Marine Reserve within the Monterey Bay National Marine Sanctuary. Supports one of the few remaining populations of sensitive foothill yellow legged frogs on the Central Coast, as well as endangered California red-legged frogs.
	San Luis Obispo Coastal Zone	Spanning 118 miles of coastline with numerous wide sandy beaches, sheltered bays, and vista points offering scenic views of the Pacific Ocean. The coastal zone of San Luis Obispo County is known throughout the state for its beauty and diversity. The north coast is characterized by the rugged headlands to Big Sur. The rocky shoreline along the Hearst Ranch is highly valued for offshore views of marine mammals as well as scenic cliffs and rocky points.
	Hearst Ranch	Hearst Ranch encompasses an impressive variety of habitats and topography - elevations on the Ranch rise from sea level along the coastline to 3,600 feet on some of the peaks along the ridgeline of the Santa Lucia Mountains. Grassland-covered coastal terraces extend to natural sea bluffs, rocky headlands and sandy beaches. Over 1,400 acres of riparian woodland is present on the property. Riparian woodland species include Sycamore and Coast live oak.
	Climate Change Considerations	
		See IRWMP, 2014 Section H, Climate Change *Data general to North County, not watershed specific*

Watershed Codes

CalWater / DWR Number	HA	Hydrologic Area Name	HSA	Hydrologic sub-area name	SWRCB Number	CDF Super Planning	CDF Watershed Name
3310.110101	1	Cambria	1	San Carpoforo	310.11	Jones Mtn.	Chris Flood Creek
3310.110102	1	Cambria	1	San Carpoforo	310.11	Jones Mtn.	Upper San Carpoforo Creek

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3310.110201	1	Cambria	1	San Carpoforo	310.11	Breaker Point	Lower San Carpoforo Creek
3310.110203	1	Cambria	1	San Carpoforo	310.11	Breaker Point	Mount Mars
Source: Excerpt from California Interagency Watershed Map of 1999, Calwater 2.2.1 (CA Resource Agency, 2004 Update)							

Major Changes in the Watershed

- Native American use of the Big Creek watershed goes back at least 6,500 years. Shell middens along the creek can be as much as 14 feet deep, indicating a long history of use. In addition, the remains of historic homestead sites still exist, like those of Gamboa and Boronda (Ventana Wilderness Alliance, 2007)
- San Carpoforo Creek was the route of the historic Portola Expedition of 1769, which led to the establishment of the California Missions and ultimately the European colonization of northern California. According to journal entries by Portola members, contact between Portola and native people took place on the banks of the San Carpoforo and therefore, the area is considered to be one of the last primal remnants of the original encounter between indigenous and European consciousness anywhere on the Pacific coast. In addition, a venerable grove of olive trees near the confluence of San Carpoforo and Dutra Creeks marks the location where an outpost of the Mission San Antonio de Padua once stood (Ventana Wilderness Alliance, 2007)
- In 1937, Highway 1 between Carmel and San Luis Obispo was completed, providing a coastal ink between the Central Coast and Northern California. (Monterey County Historical Society, 2013)

Watershed Health by Major Tributary

Tributary Name	**Ephemeral / Perennial**	**303d Listed/ TMDLs**	**Pollution Sources** NP (non-point) MP (Major Point)	**Environmental Flows**
Chris Flood Creek	Undetermined	Not assessed	Undetermined	Not assessed
Lower San Carpoforo Creek *	Undetermined	Not assessed	Undetermined	Spring: 2.0 cfs Summer: 0.62 cfs
Mount Mars Creek*	Undetermined	Not assessed	Undetermined	Not assessed
Upper San Carpoforo Creek	Undetermined	Not assessed	Undetermined	Not assessed

** Indicates independent drainage to the Pacific Ocean*

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Watershed Health by Major Groundwater Basin

Groundwater Basin	Estimated Safe Yield	Water Availability Constraints	Drinking Water Standard Exceedance	Water Quality Objective Exceedance
San Carpoforo Valley	No data available	physical limitations and potential water quality issues (Carollo, 2012)	No	None (CCRWQCB, 2011)

* No new data available since 1975

Groundwater Quality Description: Groundwater is found in Holocene and late Pleistocene age alluvium. Issues affecting the basin include seawater intrusion and limited basin yield. Recharge to the basin is largely by percolation of stream flow and to a lesser extent from infiltration of precipitation and excess irrigation flow (DWR 1958). The estimated total groundwater storage capacity is 1,800 AF (DWR 1975).

No information is available describing water quality in the basin (Carollo, 2012).

Primary Issues

Issue	*Potential Causes*	*Referenced from*
Seawater intrusion into GW basin	Reduced groundwater quantity	Carollo, 2012
Limited GW basin yield		Carollo, 2012
Outdated Groundwater Basin data		Carollo, 2012

The northern part of the San Luis Obispo Coastline and the southern part of the Monterey coastline remains one of the few minimally disturbed watersheds within our study area. However, impacts due to climate change continue to affect all areas of the County and, in combination with periods of drought, coastal creeks continue to see diminished flows which impacts the health of the ecological community.

To date, no watershed plans were identified to provide further detailed analysis of the health and/or issues facing this watershed. Further analysis is needed to know whether threats exist and what steps should be taken to maintain and enhance the health of the watershed.

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