SMW - Appendix 1 - Watershed Description

The Santa Maria Watershed is located in northwestern Santa Barbara County and Southwestern San Luis Obispo County, California. The eastern edge of the watershed is in Ventura County. The watersheds are about 50 miles north of Point Conception and about 150 miles south of Monterey Bay on the central California coast. The climate is mild with 14 inches average rainfall a year.

The area is a broad alluvial plain near the ocean, tapering gradually inland. Upland or mesa areas, foothills, and mountain complexes further define the alluvial plain boundary. The following information was taken from the Santa Maria Estuary Enhancement Plan (SMEEP, March, 2004):

> The Guadalupe-Nipomo Dunes complex, located approximately 40 miles north of Point Conception, is one of the most extensive coastal dune and dune wetland habitats in the nation. The Santa Maria River is one of the largest rivers on the central coast of California (between Point Lobos and Point Conception), and it begins at the confluence of the Cuyama and Sisquoc rivers. The Santa Maria River flows through the dunes complex and forms the estuary at its mouth. Portions of the upper Sisquoc River, from its origin in the Los Padres National Forest boundary, was designated as wild and scenic (Public Law 90-542, 16 U.S.C. 1271-1287, as amended) in 1992. Other major tributaries that contribute to the Santa Maria or Sisquoc River include La Brea Creek, Tepusquet Creek, and Foxen Creek that flow into the Sisquoc River, and Nipomo Creek, Suey Creek, and Solomon-Orcutt Creek that flow into the Santa Maria River. Huasna Creek and Alamo Creek also flow into the Cuyama River upstream from Twitchell Reservoir.
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> Downstream of Highway 1 the Santa Maria River flows freely in the natural riverbed and the channel is bordered by extensive stands of riparian vegetation (dominated by willows) in some areas, and earthen agricultural levees adjacent to cultivated fields and urbanized portions of the City of Guadalupe on the southern high river terrace. Levees in the study reach were constructed for the purpose of protecting bottomland fields from flood flows and were constructed by individual landowners rather than by the U.S. Army Corps of Engineers (USACE) or the Santa Barbara Flood Control District (SBFCD).
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> Upstream of Highway 1 the Santa Maria River is physically constrained by earthen and rock levees that were constructed by the USACE in the 1950s to protect the City of Santa Maria and adjacent agricultural lands from flooding. Flows from the Cuyama River are regulated by Twitchell Dam, which was also constructed by the Bureau of Reclamation in the 1950s as part of the comprehensive Santa Maria Flood Control Project. Twitchell Dam functions both as a water conservation and flood control facility. The USACE levees extend from Fugler Point (near the town of Garey) and terminate at the upstream side of the Highway 1 Bridge in the City of Guadalupe.

> The Santa Maria River exhibits substantial variability in its hydrology and biology. Upstream of Highway 1, the river is dry for most of the year, flowing intermittently in a braided pattern during and shortly after rainfall events, and during releases from Twitchell Dam[1]. Riparian vegetation in this reach is comprised primarily of willows, mulefat, with mock heather, coyote brush, other coastal scrub species on higher terraces, and weeds; vegetation is not contiguous and is absent in some reaches along the levees and in the scour zones. Downstream from Highway 1, shallow surface water is almost always present and riparian vegetation is more prevalent, in some places forming a wide, dense riparian corridor. Flows observed during the dry season above Highway 1 are largely a result of agricultural or urban runoff, and releases from Twitchell Dam that are conducted for the purpose of recharging the Santa Maria groundwater basin. Alternatively, flows observed downstream from Highway 1 during the dry season are due primarily to agricultural and urban runoff, as well as emergence of subsurface flow. A significant source of water into the estuary is Solomon-Orcutt Creek, which drains a primarily agricultural area as well as the community of Orcutt for a watershed area of approximately 50,000 acres.

The Santa Maria Valley groundwater basin extends south from the Nipomo Mesa to the Orcutt Uplands. The Santa Maria groundwater basin is divided into five sub-basins: the Santa Maria, Orcutt, Nipomo, and Upper and Lower Guadalupe sub-basins. The Upper Guadalupe sub-basin constitutes the upper unconfined portion of the sub-basin and the Lower-Guadalupe is a deeper confined aquifer separated from the upper sub-basin by clay layers. Coarse-grained alluvial channel deposits in the river grade to finer silt and clay flood deposits as distance from the river channel increases.

The groundwater system supplies most of the area's water supplies, and is closely related to the impairments. The land uses in the Cuyama, Santa Maria, Orcutt-Solomon, and the Oso Flaco watersheds (the Project Area) are a mosaic of open space including rangeland, irrigated agriculture, rural residential, and urban areas.

The Santa Maria River flows directly to the Santa Maria Estuary. The following information on the Santa Maria Estuary was taken from an online document (http://coastalchange.ucsd.edu/st1_thenandnow/maria.html):

> An unusual crescent beach cell, the Santa Maria littoral cell is an excellent example of the action of headlands in containing littoral transport. Its north/south trending coast is exposed to the open ocean without any island sheltering. The shelf is wide and gently sloped with no submarine canyon sink. The headland of Point Sal acts as a groin and has trapped abundant sediment principally from the Santa Maria River. Widespread dune fields are evidence of the plentiful sand supply to this cell.
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> As rising sea level moved the coastline into the wave shadow of Point Buchon 12-11,000 years ago, beaches backed by dunes probably were building on the wide, gently sloping shelf. Intermittent but strong El Niños in the period 12-8,000 years ago brought huge amounts of sand to the coast, and the El Niño wave

1 The purpose of the releases from Twitchell Dam is to recharge the Santa Maria groundwater basin. During dry periods of the year, water is released at a rate to ensure percolation occurs upstream of the Bonita School Road crossing (Santa Maria Valley Water Conservation District).

direction transported sand to the northern beaches in the shelter of Point Buchon. Under the predominantly La Niña wave climate 8-5,000 years ago, the massive headland of Buchon sheltered the beaches from northwest waves.

Estuaries developed behind the dunes as rising sea level flooded stream valleys. One of the largest estuarine systems in southern California formed near the mouth of the Arroyo Grande. Nearby, the oldest archaeological sites in the Santa Maria cell, dated to more than 9,000 years ago, contain lots of estuarine shell and the earliest radiocarbon dates on Pismo clam for the entire coast of southern California. The Pismo clam is a large slow-growing bivalve that lives only on wave-swept, perennial sand beaches.

The major watersheds in the Project Area are shown in Figure 1.

Within the Santa Maria Watershed, there are several municipalities. The largest city is the City of Santa Maria, which is located at towards the western end of the watershed. The City is approximately 22 square miles (Santa Maria SWMP, 2009, p. 2-1) and has a population of approximately 77,423 (2000 Census). To the west of the City of Santa Maria, the City of Guadalupe is home to approximately 5,659 people (2000 Census). There are also several small unincorporated towns within this watershed, including Orcutt, Cuyama and New Cuyama.

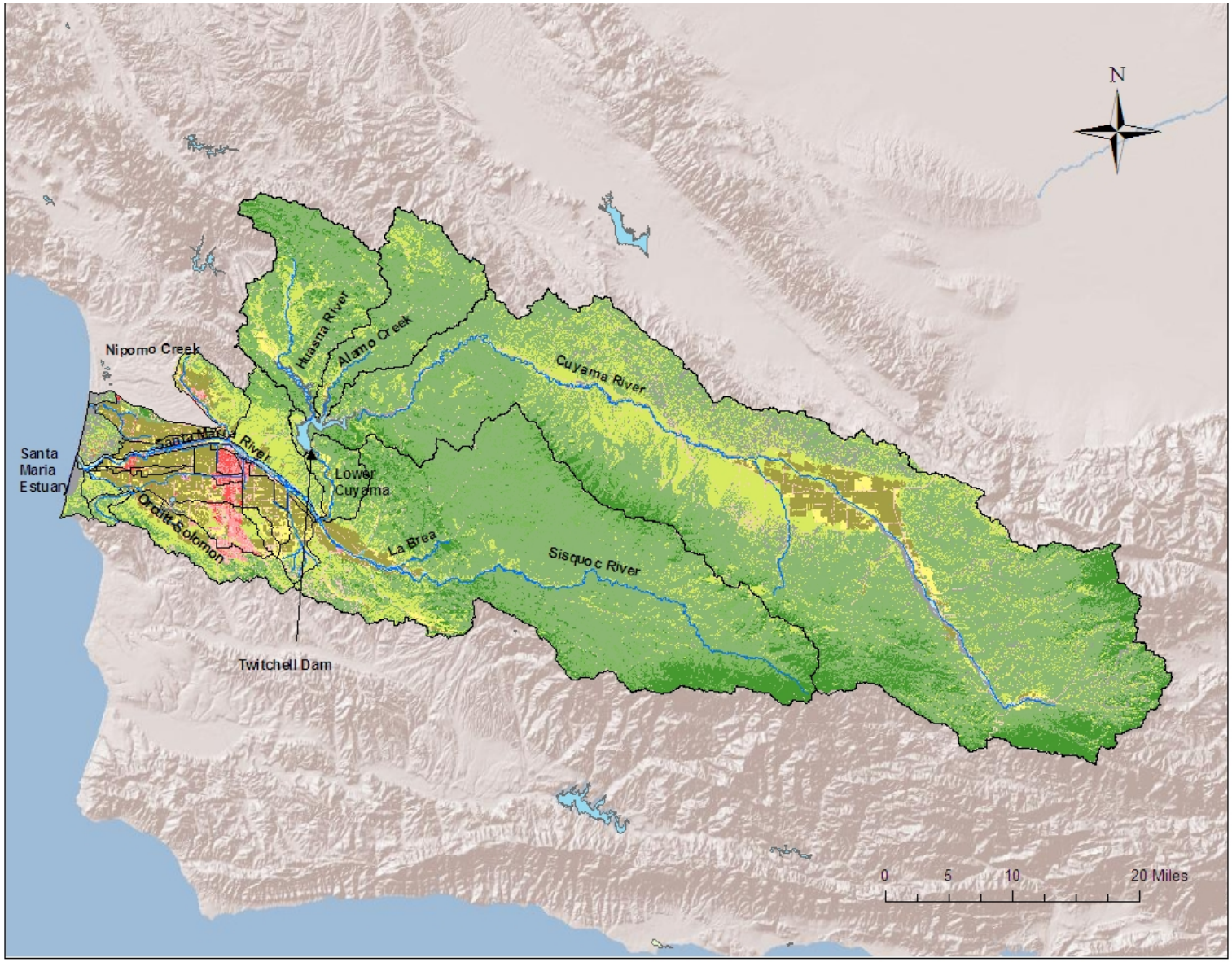

Figure 1. Major watersheds and waterbodies in the project area.