2.0 Study Area Characteristics

2.1 STUDY AREA CHARACTERISTICS

The FVGCP area boundary includes approximately 3,876 acres roughly bound by Elder Creek Road on the north, Bradshaw Road and the North Vineyard Station Specific Plan area on the east, the Churchill Downs subdivision south of Gerber Road on the south and the Union Pacific railroad corridor and Elk Grove-Florin Road on the west. The project area is a portion of the Morrison Creek Stream Group (MCSG) as shown in Figure 2.1 with 1,987 acres draining to the Elder Creek/Gerber Creek system, 816 acres to Unionhouse Creek and 824 acres draining to Florin Creek. The "remaining areas" include 154 acres draining north into Morrison Creek, 88 acres draining into Strawberry Creek and 7 acres to Laguna Creek.

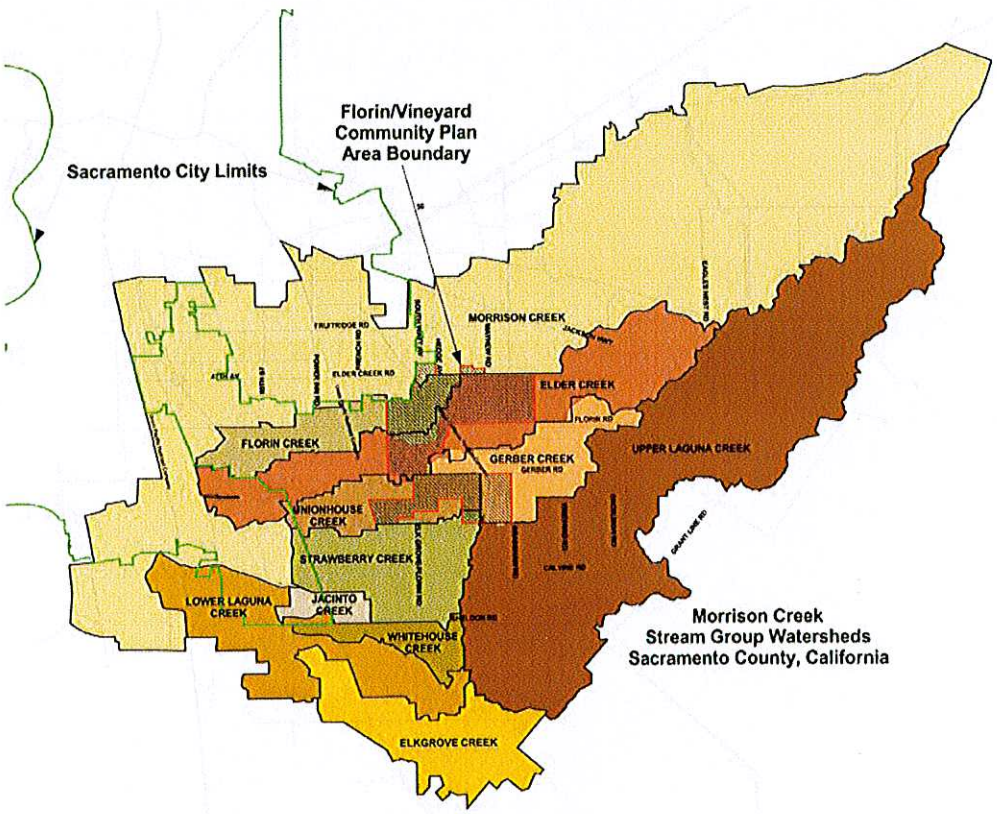

Figure 2.1 Watershed Boundaries

The drainage master plan is organized to give the reader an overview of the FVGCP study area, then develops the hydrology and hydraulic components, including land use changes, adjustments of sub-shed boundaries, and drainage improvements for

the individual creek watersheds. This is accomplished by describing the drainage characteristics and proposed improvements within the individual watersheds for Florin, Elder, Gerber, and Unionhouse Creeks.

2.2 PRE-PROJECT CONDITIONS AND FACILITIES

The FVGCP is primarily located within the watershed boundaries of Florin Creek, Elder-Gerber Creeks and Unionhouse Creek as shown in Figure 2.2.1. These creeks are tributary to the Morrison Creek Stream Group (MCSG) (see Figure 2.1). Elder and Gerber Creeks are affected during large storm events by an inter-basin transfer

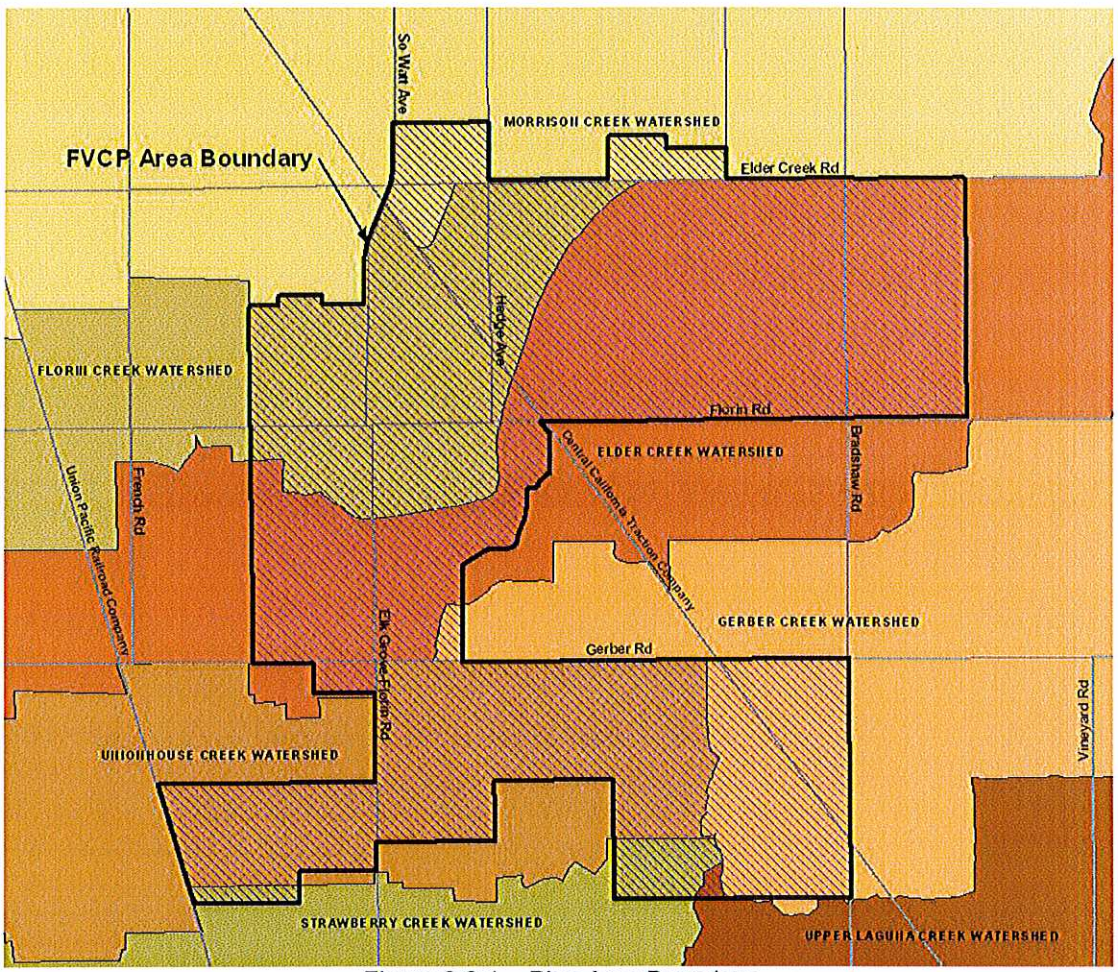

Figure 2.2.1 – Plan Area Boundary

of flood waters from Laguna Creek into their watershed area. The "remaining areas" within the FVGCP area either drain north into Morrison Creek or south into Strawberry Creek or Laguna Creek. Approximately seven acres of the project site drains to Laguna Creek under pre-project conditions. The area will drain to

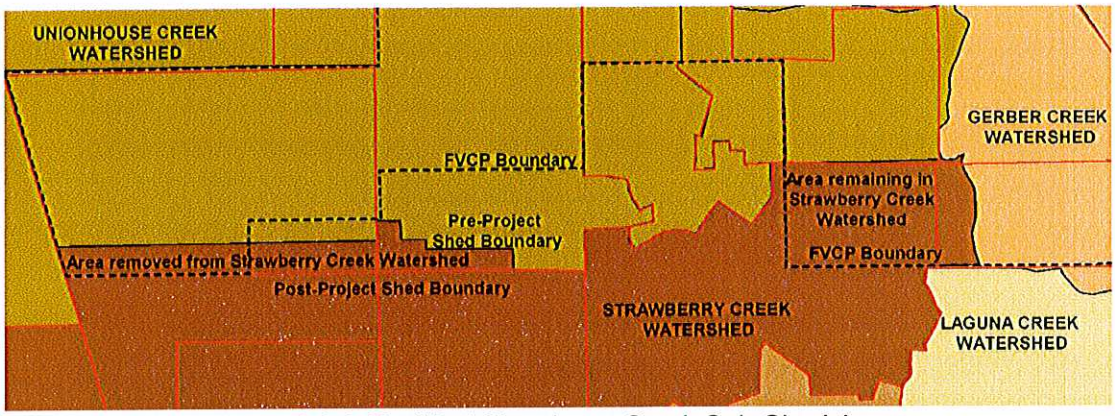

Figure 2.2.2 Modified Strawberry Creek Sub-Shed Areas

Unionhouse Creek under developed conditions so that no area within the FVGCP boundary will be draining to Laguna Creek.

The portion of the FVGCP area to the south within the Strawberry Creek shed area is approximately 59 acres. This is illustrated in Figure 2.2.2.

In the Morrison Creek shed area on the north side of the FVGCP area four sub-sheds will be affected. Figure 2.2.3 shows the portions of these sub-sheds which are within the plan boundaries. Table 2.2 provides a summary of the acreage affected.

Table 2.2 Morrison Creek Shed Areas Within FVGCP Boundaries

Sub-Shed	Morrison Creek Area at Watt Ave (ac)	Area Within FVGCP (ac)	Percent of Total Shed within FVGCP Boundary
MC60A	16448	50.8	0.3
MC60B	18604	42.2	0.2
MC65	18604	28	0.1
MC80	18604	23	0.1
Total	18604	144	0.8

Impacts due to the proposed development of the revised "remaining areas" are evaluated using a proportioned estimated impact analysis, rather than performing

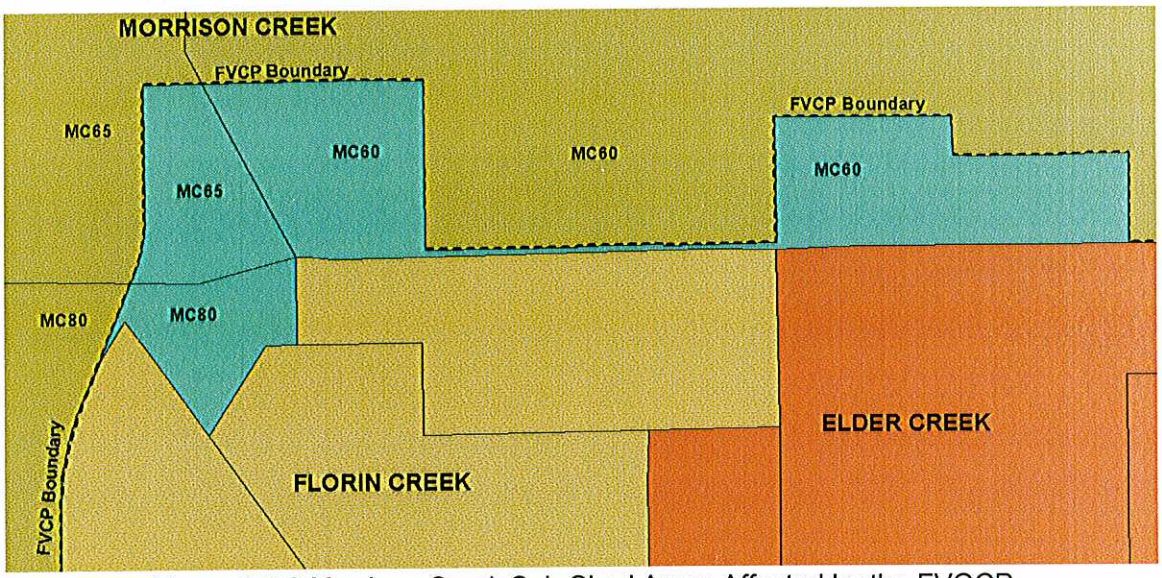

Figure 2.2.3 Morrison Creek Sub-Shed Areas Affected by the FVGCP

detailed hydrology. Detailed hydrologic analysis may be required for future projects developing in the outlying "remaining areas".

- **Florin Creek**

The overall Florin Creek watershed encompasses about 2,762 acres, of which approximately 824 acres (30%) are located within the FVGCP area. Florin Creek starts east of the intersection of Elk Grove-Florin Road and Florin Road and flows in a southwesterly direction.

Figure 2.2.4 Florin Creek Channel Downstream of CCTRR

The upper reach of the watershed, described as "Florin Creek – North", is fed by runoff from ranches, small farms, gardens, pasture and undeveloped lands. The main channel has been redirected from its original natural alignment and redefined within roadside ditches and excavated swales as shown in Figures 2.2.4 and 2.2.5. The existing

channel flows leave the study area at the northwest corner of the FVGCP area, crosses Florin-Perkins Road, and continuing west.

A south tributary to Florin Creek identified as "Florin Creek – South" serves the area immediately north and south of Florin Road. An existing trunk drainage pipeline within Florin Road that begins at the intersection of Florin Road and South Watt Avenue drains this area. The trunk pipeline, which is 66 inches in diameter at the discharge point, conveys flows to the existing trapezoidal channel, crossing Florin-Perkins Road and subsequently joins the main channel of Florin Creek to the west, upstream of McComber Street. Florin Creek joins with Elder Creek, downstream of Franklin Boulevard, which discharges to Morrison Creek near Brookfield Drive, approximately 4 miles southwest of the Plan Area.

Figure 2.2.5 Florin Creek Channel Downstream of South Watt Avenue

- **Elder and Gerber Creeks**

The Elder-Gerber Creek systems are the primary watersheds within the area of the FVGCP with a total of 10,491 acres; 7,636 acres in the Elder Creek watershed and 2,855 acres in the Gerber Creek watershed. The contributing area within the FVGCP is approximately 19 percent or 1,987 acres.

Elder and Gerber Creeks within the plan area are subdivided into three sub-reaches. The portion of Elder Creek upstream of the confluence with Gerber Creek originates near the intersection of Kiefer Boulevard and Eagles Nest Road. The creek conveys flows within natural swales and existing channels and enters the FVGCP area east of Bradshaw Rd. Flow continues in a southwesterly direction to Florin Road (See Figure 2.2.6) where it leaves the FVGCP and enters the North Vineyard Station Specific Plan area (RM 6.9). Approximately half of the creek's upper reach through the northern portion of the Plan area remains in natural channels with a broad and shallow flood plain. The next section of Elder Creek forms the common north-south boundary with the North Vineyard Station Specific Plan between Florin Road and the confluence with Gerber Creek. Here, flows reenter the

Figure 2.2.6 Elder Creek Upstream of Florin Road

FVGCP area (RM 5.994) and are conveyed in an existing trapezoidal channel (See Figure 2.2.7) in a westerly direction. Elder Creek flows out of the FVGCP area approximately 1 mile downstream of the confluence (RM 4.904). Portions of Gerber Creek convey flows through the FVGCP area on the south side of Gerber Road between Bradshaw Road (RM 1.735) and the intersection of Gerber Road with the CCTRR railroad tracks (RM 1.340) and from the western boundary of the NVSSP (RM 0.040) to the confluence with Elder Creek. Elder Creek eventually discharges into Morrison Creek near Brookfield Drive in the City of Sacramento, approximately 4 miles west of the Plan Area.

The Laguna creek system also has significant influence and impact on Elder Creek through the Inter-Basin-Transfer. Gerber Creek receives floodwaters during the 100-yr event from Laguna Creek via the Laguna Creek Inter-Basin-Transfer that spills approximately 840 cfs peak flow into Gerber Creek upstream of the C.C.T.R.R. right-of-way (RM 1.616) and approximately 200 cfs downstream of the C.C.T.R.R. right-of-way. (RM 0.906)

Figure 2.2.7 Elder Creek Upstream of Elk Grove-Florin Road

- **Unionhouse Creek**

Unionhouse Creek begins east of Elk Grove-Florin Road, near the end of Surlingham Court (RM 6.991). Unionhouse Creek conveys flows in a westerly direction primarily within an excavated trapezoidal channel. Unionhouse Creek merges with Strawberry Creek approximately 2 miles southwest of the FVGCP. The total Unionhouse Creek watershed contains approximately 2,178 acres, 816 acres of which are contained within the FVGCP.

The Laguna Creek flow transfer to Gerber Creek has the potential to impact Unionhouse Creek as documented in the previously referenced Elder-Gerber Creek LOMR study. During high flow conditions a portion of the Gerber Creek floodwaters could spill into Unionhouse Creek downstream of the C.C.T.R.R. right-of-way. The study indicates this would only occur in the event of a FEMA levee policy failure of Gerber Road and does not occur in the base condition model for Elder-Gerber Creeks used in this study. The modeling for Unionhouse Creek in this study does not consider this possible scenario.

Two existing subdivisions, Churchill Downs Unit 2 (located west of Waterman Road) and the Tamarindo subdivision (located east of Elk Grove-Florin Road) and an area designated as a wetland preserve currently drain into the upper reach of Unionhouse

Creek. An existing detention basin (UH-1) was partially constructed with the Tamarindo project to control flood waters, and has some room for expansion. The creek conveys flows west, in a trapezoidal channel to where it exits the FVGCP area through twin 72-inch culverts under the Union Pacific (old Southern Pacific) Railroad (RM 5.332) corridor.

2.3 TOPOGRAPHY AND GEOGRAPHICAL SETTING

The Morrison Creek Streams Group (MCSG) area is a fairly gently sloping region located south of the American River roughly between Folsom Lake and the Sacramento River. These streams flow in a generally west-southwest direction, from their beginning near the base of the Sierra Nevada foothills to nearly the Sacramento River. The MCSG is contained east of the Sacramento River Levee system, and conveys flows south to the discharge at the Cosumnes River.

Stream slopes for the three main streams flowing through the area of the FVGCP are fairly flat at less than 0.15% overall. This results in generally slower moving wide flow paths except where otherwise constrained or in generally short segments with steeper drops at, for example, road and/or bridge crossings.

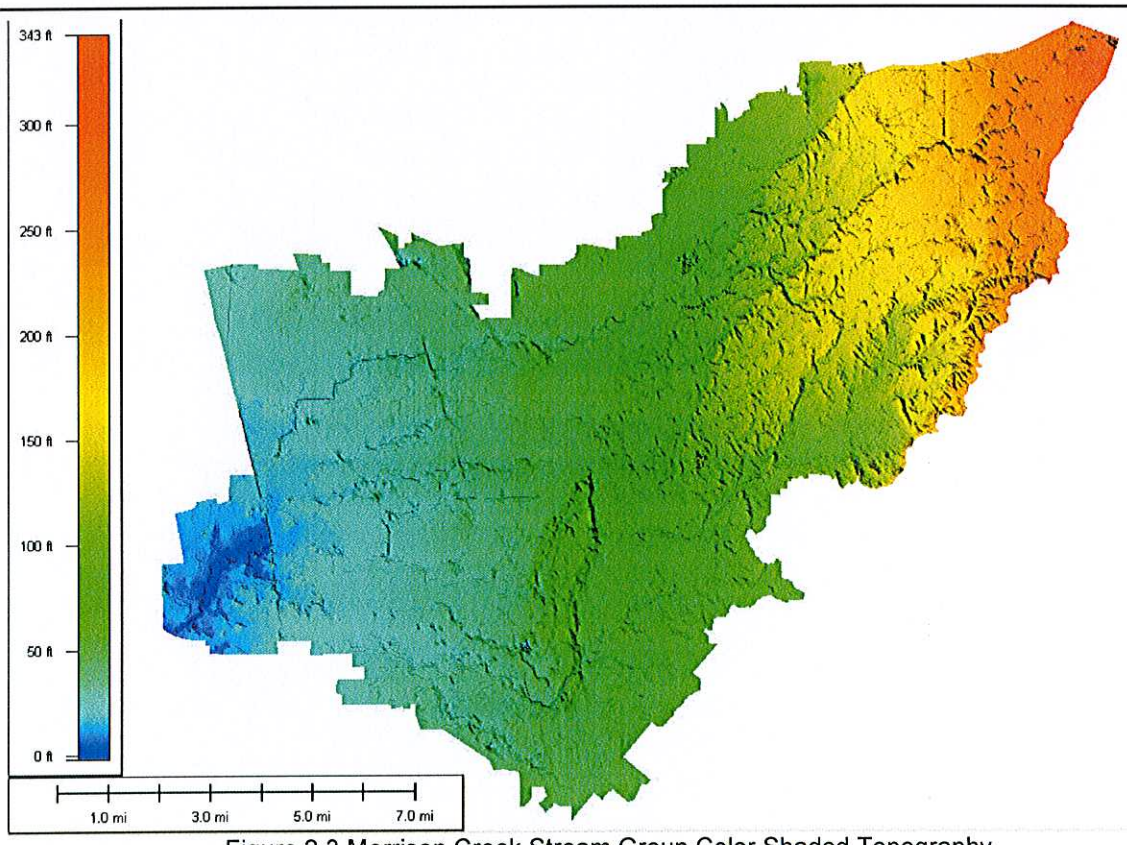

Figure 2.3 Morrison Creek Stream Group Color Shaded Topography