

# **Habitat Mitigation Monitoring Plan for the Foothill Road Low Water Crossing Removal and Construction of Bridge 51C-031 on the Cuyama River**

Foothill Road Low Water Crossing on the New Cuyama River, Santa Barbara County CA.



Prepared for:

**Crystal L.M. Huerta**

**Biologist, Senior Project Manager**

**North Coast Branch (CESPL-RGN)**

**Los Angeles District, U.S. Army Corps of Engineers Regulatory Division, North Coast Branch**

**60 South California Street, Suite 201**

**Ventura, CA 93001**

Prepared for:

**Bureau of Land Management, California**

**Bakersfield Field Office**

**Department of the Interior, Region #8/10**

Prepared by: **Morgan M. Jones**

**Engineering Environmental Planner, Senior**

**Santa Barbara County Public Works Dept.**

**Santa Barbara, Ca 93101-2065 (805) 568-3059**

**Table of Contents, Foothill Road Habitat Restoration Plan for County Bridge 51C-381  
August 1, 2020**

		<b>Page</b>
<b>1.0</b>	<b>Introduction</b>	<b>3</b>
	1.1 Background information	3
	1.11 <b>Figure One</b> Project Location Map	4
	1.12 <b>Figure Two</b> BLM Right-of Way Grant areas	5
	1.2 Project description	5
	1.3 Mitigation Goals and Objectives	7
<b>2.0</b>	<b>Existing Site Proximity to Endangered Species &amp; Habitat</b>	<b>8</b>
<b>3.0</b>	<b>Project Site Characteristics</b>	<b>10</b>
	3.1 Topography	10
	3.2 Soils	10
	3.3 Existing Vegetation	10
	3.3.1 <b>Figure Three</b> Vegetative communities and land cover types	11
	3.4 Project Construction Impacts to Habitat	14
	3.4.1 <b>Figure Four:</b> Project Impact Area Map	14
	3.5 <b>Figure Five</b> Climate and Rainfall Data for last 110 years	15
<b>4.0</b>	<b>Proposed Mitigation</b>	<b>15</b>
	4.1 Habitat Restoration	16
	4.2 Site Preparation	16
	4.3 Timing	16
	4.4 Plant Pallet and Cutting Sources	17
	4.4.1 Table of Plant Species Pallet	18
	4.5 Planting Locations	19
	4.5.1 Planting Species Location by Topographic Delineation	19
	4.5.2 Planting Plan and Procedure for Container Plants	19
	4.5.3 <b>Figure Five:</b> Diagram for planting container plants	20
	4.6 Irrigation	20
<b>5.0</b>	<b>Maintenance</b>	<b>21</b>
	5.1 Weed Control	21
	5.2 Irrigation	21
<b>6.0</b>	<b>Performance Measures</b>	<b>22</b>
	6.1 Success Criteria	22
<b>7.0</b>	<b>Mitigation Monitoring</b>	<b>22</b>
	7.1 Methodology	22
	7.2 Schedule	22
	7.3 Reporting	23
<b>8.0</b>	<b>Contingency Measures</b>	<b>23</b>
<b>9.0</b>	<b>References</b>	<b>23</b>
<b>10.0</b>	<b>Appendix One: Seed Pallet for hydro-seed mix</b>	<b>25</b>

## **1.0 INTRODUCTION**

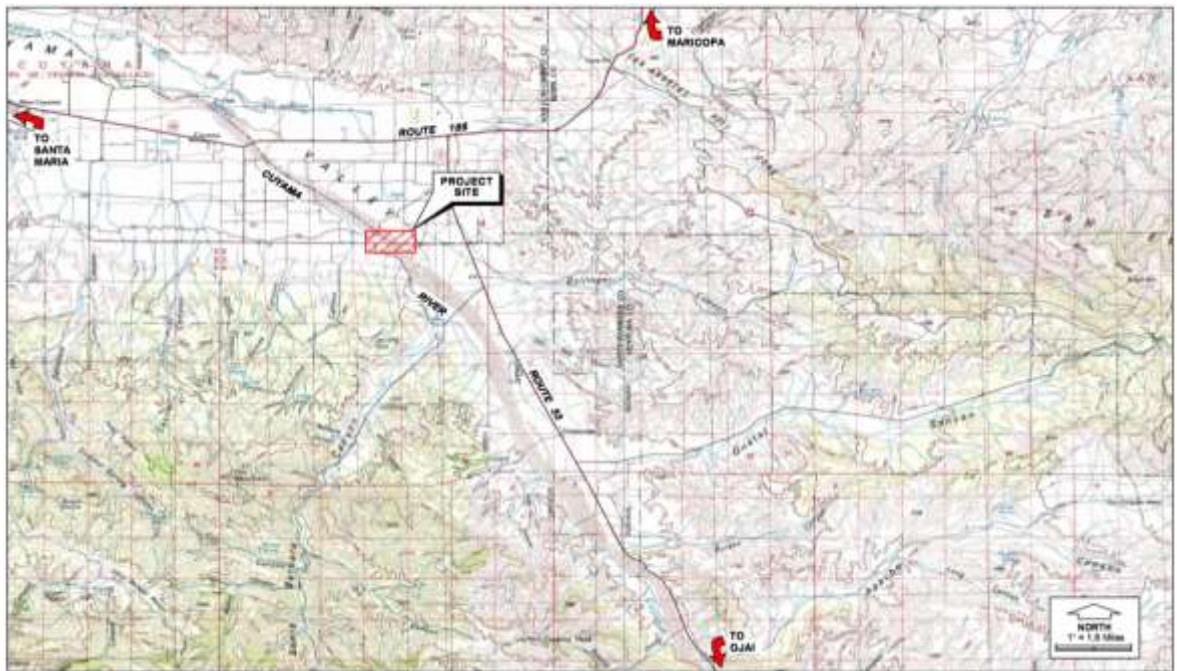
The plan was prepared by Santa Barbara County Public Works environmental planning staff to comply with USACE Nationwide SPL-2018-00669-ERB, RWQCB 401 Certification 34218WQ36 and CDFW 1602 Streambed Alteration Agreement Notification No 1600-2019-0045-R5. The Bureau of Land Management (BLM) will be authorizing this project through the issuance of a right of way grant for the bridge and access road located on BLM land. The plan describes measures that will be implemented on Foothill Road as mitigation for jurisdictional construction impacts related to the construction of County bridge 51C-381 over the Cuyama River.

### **1.1 Background Information**

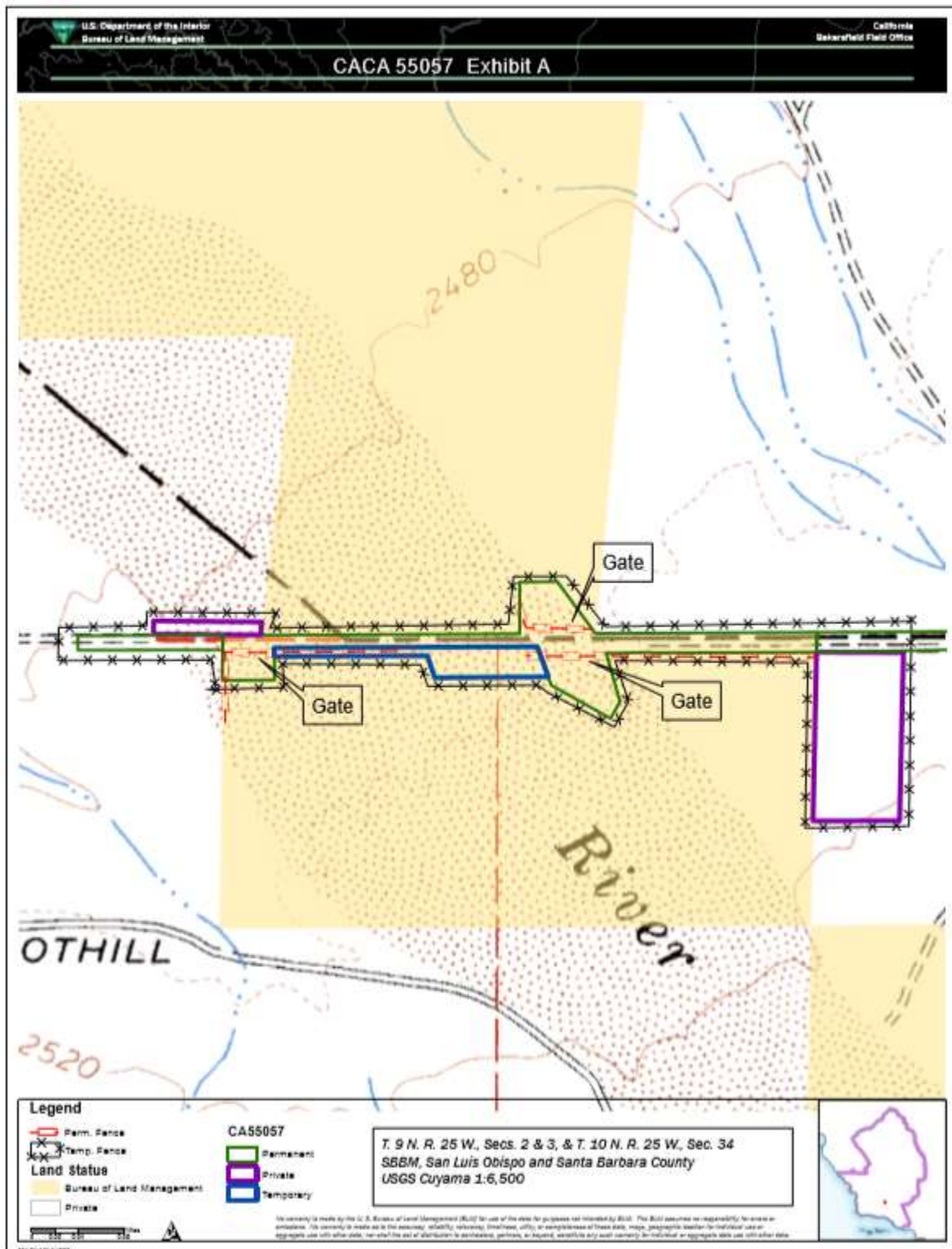
The project location is on Foothill Road along the upper reaches of the Cuyama River approximately two miles downstream of its confluence with Santa Barbara Canyon. The 1,140 square mile upper Cuyama River watershed empties into Twitchell Reservoir, about 53 miles downstream. The project area is in the southeastern portion of the Cuyama Valley, a relatively level area located between the Santa Ynez Mountains to the south and the Caliente Range to the north. The Cuyama Valley is about two miles wide at the project location, but is about 5 miles wide in the vicinity of Cuyama, to the northwest. The elevation of the Cuyama Valley increases from the northwest to the southeast. A large portion of the project location is within Bureau of Land Management (BLM) jurisdiction and requires a United States Department of the Interior BLM Right-of Way Grant/Temporary Use Permit. The BLM Right-of Way Grant/Temporary Use Permit issued to the County of Santa Barbara requires compliance with all applicable regulations contained in Title 43 Code of Federal Regulations parts 2800 and 2880. The BLM Right-of Way Grant areas are shown in Figure Two (CACA 55057 Exhibit A).

As groundwater resources in the Cuyama Valley have been depleted over the years, riparian vegetation within the valley has undoubtedly changed. Cottonwood trees (*Populus fremontii*) may historically have been found within the river valley but now are only found in a few locations along HW166 in the western end of the valley. An analysis of historic aerial photographs of the river valley through time has provided data as to how the decline of the water table has affected the distribution of riparian vegetation within the valley. Review of historical aerial photographs revealed a significant loss of riparian vegetation concurrent with the expansion of intensive agriculture. 1938 aerial photographs depict a region along the Cuyama River channel that contained identifiable riparian vegetation. By 1978, patches of dark vegetation remain, but are conspicuously absent in subsequent years. As the agriculture intensified and encroached upon the river channel, much of the visible, woody riparian vegetation historically present along the Cuyama River was lost. The long-term trend suggests that narrowing of the river channel and proportional loss of riparian vegetation can be attributed to the combined effect of groundwater extraction and land conversion to agriculture.

There are extensive flow training works (FTW) upstream and downstream of the proposed bridge location. These bank stabilization devices consist of pipe and wire groin revetments. The revetments were constructed in 1979 by the U.S. Department of Agriculture (USDA) Soil Conservation Service (now called the Natural Resources Conservation Service). As part of the USDA 1979 project about 18,000 feet of pipe and wire were installed in front of a specially constructed earth berm on each side of the river at the foothill road low water crossing. As part of the USDA project about 10,500 woody cuttings of salt cedar (*Tamarix pentandra*) and 9000 cuttings of athel (*Tamarix aphylla*) were planted at the toe of the embankment and three feet up the side of the embankment on a 3-foot spacing. The 10,500 woody cuttings of salt cedar (*Tamarix pentandra*) were harvested in Kern County and about 9000 cuttings of athel (*Tamarix aphylla*) in Fresno County. Salt cedar and athel were chosen for planting because of their ease of establishment. The embankment material was mostly riverbed gravel and sand and had a very low water holding capacity. A total of 25 acres of the levee were planted with 120 lbs. per acre of barley and 12 lbs. per acres of four wing saltbush (*Atriplex caesens*). About six acres were planted with desert saltbush (*Atriplex polycarpa*). The woody cuttings were collected in late February 1980 and planted in March 1980. This site had been spot checked periodically and based on the spot checks by 1984 it was estimated that less than 20% of the woody cutting were alive. This low survival rate is a function of several different factors. The area generally receives less than 10 inches of rain per year and the Cuyama River is intermittent. Because of the harsh environmental site conditions, the plantings were to have been irrigated with a temporary irrigation system, it is likely that inadequate water was applied in some areas. The site was also slightly damaged by flooding in 1980 and suffered substantial additional flooding damage in 1982.



**1.11 Figure one.** Map of Project location: Santa Barbara County Proposed Bridge 51C-381 over the Cuyama River



1.12 Figure Two. Map of Project location delineating BLM easement areas



## 1.2 Project Description

The existing low water crossing is a concrete slab structure that bi-sects the Cuyama River from the east to west. The actual bank-to-bank crossing distance across the Cuyama River is approximately 1,600 feet, with a maximum roadbed width of 35 feet.

The project proposed, new bridge 51C-381 consists of a multi-span cast-in-place post-tensioned concrete slab bridge with seat abutments founded on pile footings. The structure will be 1,430' long and 39', 10" wide, including two 12-foot travel lanes, two 4-foot paved shoulders, and a 5-foot wide pedestrian walkway. Concrete barriers would be provided to provide safety separation between the traffic lanes and pedestrian walkway. The edge of the bridge deck along the pedestrian walkway would be provided with a metal picket hand railing. The top of the bridge deck would be a maximum of 20 feet above the river bed. The project will also include approach roadways and drainage improvements. Existing maintenance access roads along the river banks will be reconstructed to tie into the revised Foothill Road profile.

Due to the meandering nature of the Cuyama River, the bridge approaches, bridge and abutments would be protected from scour by a layer of buried rock slope protection (RSP) to control potential lateral channel movement. At the western abutment, approximately 330 linear feet of RSP would be placed immediately north of and parallel to Foothill Road west of the river bank, and curve to the right along the river bank. At the eastern abutment, approximately 365 linear feet of RSP would be placed at about a 30-degree angle to the proposed bridge, parallel with river flow, both north and south of Foothill Road. A small triangular area (about 0.7 acre) of river bank/floodplain would be retained just west of the proposed RSP for river bank habitat restoration. Existing failed bank protection (USDA rock and remnant pipe-and-wire revetment) on the east bank would be removed from this triangular area.

The RSP would be composed of one-half ton rock with backing rock, placed on a 2:1 (horizontal:vertical) manufactured fill slope. The bottom of the RSP would be placed 5 feet below the riverbed elevation, with the top of the RSP located one-half foot above the projected water surface elevation of a 100-year storm event. The top and face (river-side) of the RSP would be covered with two feet of fill, with backfill behind (landward) of the RSP.

The two areas formed between the access roads, Foothill Road and the soil covered RSP along the river will act as retention basins which would allow for natural percolation of the deck drainage from the bridge. Deck drains are proposed along both sides of the structure and along the pedestrian path to prohibit water from running off the proposed bridge into the river below. The deck drains will connect to pipes running within the bridge and then connect to drainage systems at each corner of the bridge. Drainage runoff will outlet to holding ponds created by the southern access roads.

The bridge project is proposed to be constructed in two stages/seasons.

### **1.3 Mitigation Goal and Objectives**

The mitigation goal is to return the impacted Cuyama bank area to a natural vegetated condition after construction activities resulting from the new bridge, and restore the upland areas along the roadway shoulder favorable to local fauna.

The project will have soil disturbing temporary impacts of 6.6 acres. Impacts will be mitigated with native shrubs and trees to help restore the vegetation lost during construction activities will be revegetated to promote restoration of the area to pre-project conditions. To stabilize the river banks and road construction impacts will require of restoration of each side of the river banks. The total restoration area for the project will be approximately 2.02 acres (88,676 sf).

The project impacts within waters of the U.S. would include both temporary (construction related disturbance) and permanent impacts. Construction-related disturbance would include providing access, stream diversion (if required), installing bridge piles, constructing the bridge abutments and bridge deck, and installing RSP. A small sliver of the proposed eastern RSP (0.01 acres) would be located within Ordinary High-Water Mark (OHWM) and United States Army Corps of Engineers jurisdiction) and considered a permanent impact. The proposed restoration and revegetation areas are approximately two acres in size and is composed of two separate areas. These areas cover the east bank and the west bank of the Cuyama River and also includes along the right of way adjacent to Foothill Road that will be disturbed by construction activities primary adjacent to the bridge.

The Summary of Impacts within Jurisdictional Areas (acres): Impacts to Waters of the U.S. is approximately 2.4 acres and within CDFW Jurisdiction construction disturbance is approximately 4.2 acres. The Western RSP is not within the Ordinary High-Water Mark (OHWM) which is Corps jurisdiction. RSP would be buried and not considered a permanent impact to CDFW jurisdiction when buried under two feet of earth.

The scope of on-site activities covers approximately 88,676 square feet or 2.02 acres. The proposed mitigation area on site will be covered with a compost blanket with a native seed hydro-seed mix shown in appendix one.

The proposed mitigation area will include 1) a compost blanket and native seed hydro-seeding and planting of native vegetation 2) weed removal and watering, 3) performance of periodic maintenance, monitoring and reporting.

The mitigation objectives are to establish self-sustaining native vegetation on the river banks and along the slopes of the riverbanks within five years, reduce slope erosion and to limit invasive plant species from the restoration area.

In the long-term restoration of the right of way along above top of bank slope area will benefit the water quality of the downstream riverine habitat by reducing soil erosion and establishing a

vegetative filter of petroleum and other contaminants from the roadway. Water quality will also be benefited with the placement of retention basins to capture water runoff from the roadway and bridge deck surface and recharge the river.

### **Existing site proximity to endangered species habitat.**

#### **Blunt-nosed leopard lizard (*Gambelia sila*) from the biological study area**



The Blunt-nosed leopard lizard (BNLL) is an endangered species that likes flat arid environments with sparse vegetation and sandy soil, allowing plenty of room to run. BNLL will not use lands that have been tilled for agriculture. It may take up to ten years for the lizard to re-inhabit previously tilled land. Lands surrounding agricultural areas may seem like suitable habitat, but in fact may not support populations of the leopard lizard due to pesticide spraying (NatureServe 2008). Each male can have a home range of up to 22 acres, but there may be some overlap between home ranges (NatureServe 2008). Three habitat types found in the valley are particularly suitable for the leopard lizard including, grasslands, desert washes, and alkali flats.



## Wildlife Corridors and Habitat Connectivity

Highly mobile species such as larger mammals and birds are expected to move between coastal and inland areas such as the Cuyama Valley. The Cuyama River links the Santa Maria Valley and adjacent coastal areas to the inland and montane habitats of the Los Padres National Forest (LPNF). The Cuyama River provides a means for wildlife to traverse mountainous areas with dense vegetation and steep slopes. However, the LPNF is generally undeveloped and numerous canyons and ridgelines offer opportunities for wildlife to move through the region. Therefore, the importance of the Cuyama River as a wildlife movement corridor is unclear. Mammal tracks (coyote) were observed in the Cuyama River within the BSA during the field surveys, indicating wildlife may be using the river as a movement corridor.

**Wildlife Habitat Connectivity** Habitat connectivity provides important ecological functions relating to biodiversity, gene flow, population dynamics and species movement and dispersal (McRae et al. 2008). Given its east-west orientation, gentle topography, and position between large tracts of protected land, the Cuyama Valley appears well-suited facilitate to wildlife movement from the coast inland along the river valley. This habitat connectivity may prove crucial for species dispersal and adaptation to climate change. Highway 166 is an impediment to species movement within the valley. Further agricultural development and diminished water resources may degrade the existing connected habitats and threaten viability. The Cuyama River may also provide habitat connectivity from the Cuyama Valley for species moving north south between the Carrizo Plain and LPNF.

## Wildlife

The wildlife habitat value of the biological study area is moderate, in that much of it is disturbed by storm flows and cultivation. However, vegetated terraces above the low flow channel provide suitable scrub habitat for most of the wildlife species known from the Cuyama Valley. Observed vertebrate species include those seen or detected by track, scat, burrows or vocalizations (calls, songs, etc.). Vertebrate taxa expected for the area are based on sight records from other environmental documents (Hunt & Associates, 2008; Baumgardner Biological Consulting, 2002, 2003a, 2003b); range maps (Zeiner et al., 1988, 1990a, 1990b); and bird species reported from the Cuyama Valley area of Santa Barbara County (Lehman, 2015).

Due to the lack of surface water, no fish were observed within the biological study area during field surveys. Swift et al. (1993) reports arroyo chub and partially-armored three-spined stickleback in the lower Cuyama River near Twitchell Reservoir, about 50 miles downstream. Due to the lack of consistent surface water, fish are considered absent from the biological study area. Amphibians were not observed during field surveys of the biological study area.

Five reptile species were observed during field surveys, including side-blotched lizard (*Uta stansburiana*), coast horned lizard (*Phrynosoma blainvillii*), California whiptail lizard (*Cnemidophorus tigris mundus*), blunt-nosed leopard lizard (*Gambelia sila*) and gopher snake

(*Pituophis catenifer*). Ten other reptiles are known to occur in the region and may occur within the BSA.

### **3.0 Project Site Characteristics**

#### **3.1 Topography**

The project area elevation varies from approximately 2,460 to 2,520 feet above mean sea level. The biological study area includes approximately 2,300 linear feet of the Cuyama River. The project area is located in the southeastern portion of the Cuyama Valley, a relatively level area located between the Santa Ynez Mountains to the south and the Caliente Range to the north. The Cuyama Valley is about two miles wide within the area, but is about 5 miles wide in the vicinity of Cuyama, to the northwest. The elevation of the Cuyama Valley increases from the northwest to the southeast.

#### **3.2 Soils**

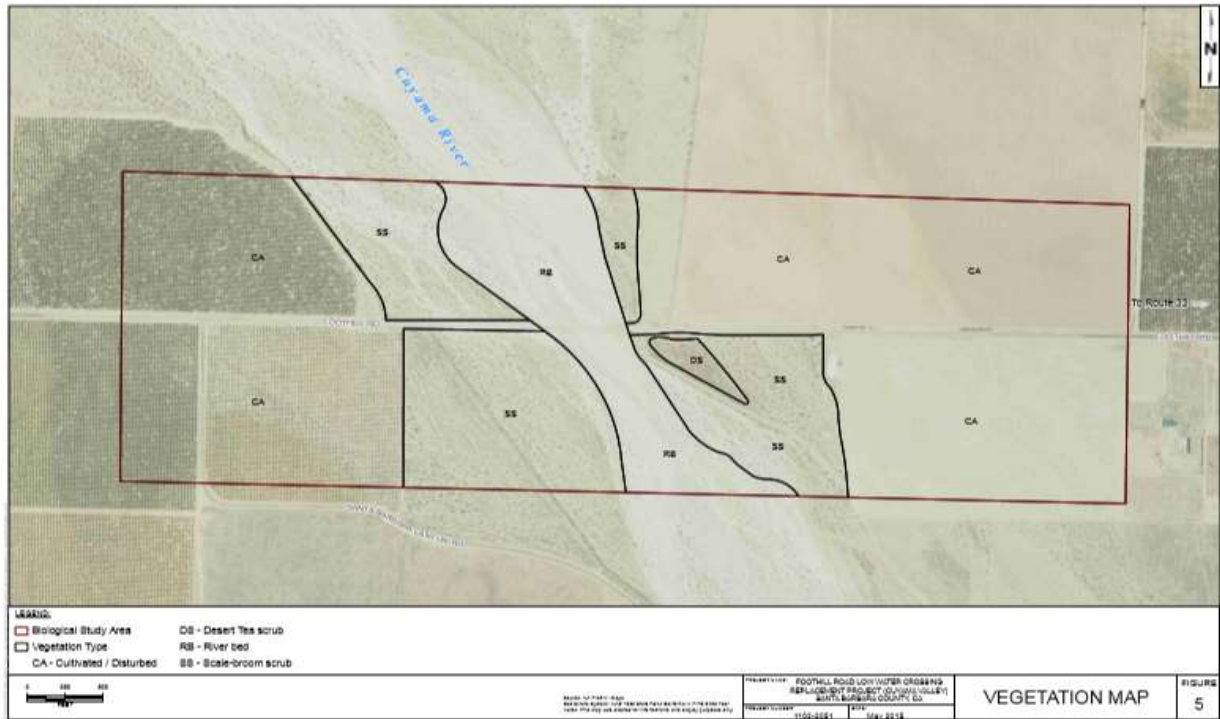
The US Department of Agriculture Natural Resources Conservation Services mapped the soils in the project area.

The soil type characteristics are described below:

An agricultural assessment of the area defines the soils on site as Class 8 River wash. Soils adjacent to this are sandy alluvial according to Web Soils Survey of the USDA. Slopes are from 0-5% in the PIA. The first 6" of soil are sand, with the following 6-60" being stratified coarse sand to sandy loam, and the water table lies just 24" below ground. This soil is excessively drained and the groundwater basins are over-mined. Average annual rainfall is 7.7" in the project area, however during the 2010-2011 rainy season rainfall was 40% above normal at Fire Station #41.

#### **3.3 Existing Vegetation**

The following vegetative communities and land cover types were identified in association with the main channel and adjacent terraces of the Cuyama River.



**3.3.1 Figure Three:** vegetative communities and land cover types

The following vegetative communities and land cover types were identified within the biological study area which covers approximately 88.5 acres:

A summary of vegetation/wildlife habitat loss from the project is provided below. The estimated 0.30 acres of permanent habitat loss would be more than offset by removal of the at-grade river crossing, which would allow for colonization of 0.55 acres by scale-broom scrub. This area represents the portion of the existing at-grade roadway that is outside the Cuyama Riverbed channel. The excavation to remove the roadway and associated base material is mitigation for the project, the existing Arizona type road crossing the river alters physical processes such as bed load and sediment transport, natural surface flows, and channel adjustment. The removal of existing at-grade roadway will restore the natural riverine processes to the upper Cuyama River watershed. The proposed project would not affect any sensitive plant communities or habitats.

Vegetation/Habitat	Area within BSA	Area within PIA	
		Construction-related Disturbance	Displacement by Structures and RSP
Scale-broom scrub	78.0	4.8	0.28
California desert tea scrub	2.5	0.3	0.00
Riverbed	36.5	2.6	0.01
Cultivated/disturbed areas	208.2	11.6	0.01
<b>Total</b>	<b>325</b>	<b>19.3</b>	<b>0.30</b>

Based on the results of a Natural Environment Study prepared for the project which included biological surveys and a preliminary wetland delineation. A total of 108 vascular plant species were identified during the field surveys of the biological study area. Plants observed within the biological study area consisted of 82 (76 percent) native taxa and 26 (24 percent) non-native, naturalized, or ornamental taxa.

### Scale-broom Scrub

This community occurs along the margins of the low flow channel of the Cuyama River, in areas that are only occasionally affected by storm-related erosion. Dominant species include scale-broom (*Lepidospartum squamatum*), rubber rabbit-brush (*Ericameria nauseosa*), and California buckwheat (*Eriogonum fasciculatum*). Ground cover in this community is dominated by spring annuals including red-stem filaree (*Erodium cicutarium*), woolly-star (*Eriastrum densifolium*), California evening primrose (*Oenothera californica*), summer mustard (*Hirschfeldia incana*) and red brome (*Bromus madritensis* ssp. *rubens*). The area southeast of the Foothill Road crossing appears to have been cleared within the last 10 years and supports a low density of native shrubs (mostly scale-broom). Approximately 4.8 acres of this plant community occurs within the PIA and would be directly affected by project construction.

### California Desert Tea Scrub

This community occurs in sandy areas along the Cuyama River, mostly in areas that are rarely inundated. The dominant species is California desert tea (*Ephedra californica*), other common species include California match-weed (*Gutierrezia californica*) and burro brush (*Ambrosia salsola*). Spring annuals in this community include redstem filaree, California goldfields (*Lasthenia californica*), valley lessingia (*Lessingia glandulifera*) and leptosiphon (*Leptosiphon liniflorus*). Approximately 0.3 acres of this plant community occurs within the PIA and would be directly affected by project construction.

## **Riverbed**

This community represents encroachment of scale-broom scrub into the low flow channel of the Cuyama River, and is comprised of scattered small shrubs and annuals that colonize this area between storm flows. Scale-broom is the dominant species, but many other species may be found here including tumble mustard (*Sisymbrium altissimum*) and cryptantha (*Cryptantha intermedia*). Approximately 2.6 acres of this plant community occurs within the project impact area and would be directly affected by project construction.

## **Cultivated/Disturbed Areas**

This designation is used to describe weedy roadside areas and agricultural areas within the BSA, including orchards (mostly pistachio) and row crops.

Four-wing Saltbush. Approximately 50 individuals of this species were observed in the Biological study area, with approximately 10 within the project impact area. Four-wing saltbush is very common in the Cuyama Valley and abundant in the San Joaquin Valley, but is considered rare in Santa Barbara County since it occurs only in the extreme northeastern portion of the County.

Hoover's Eriastrum. Several thousand individuals of this species were found within the BSA in 2013 and 2015, mostly within scale-broom scrub and along the sandy shoulder of Foothill Road. Hoover's eriastrum appears to be common in the region, reported from three nearby surface mining sites including GPS River Rock Products (RAM Environmental Engineering Services, 2007), Diamond Rock (Baumgardner, 2003a) and an unnamed proposed mining site (Hunt & Associates, 2008). In addition, the CNDDB reports Hoover's eriastrum along a 1 mile segment of Foothill Road approximately 0.5 miles west of the biological study area.

Cuyama Gilia. This species was observed in low numbers in the biological study area in 2013 and 2015, including the PIA. Cuyama gilia typically occurs within pinyon and juniper woodland, which does not occur within the biological study area. This species is considered a plant of limited distribution by CNPS (List 4), but is found in Kern County, Los Angeles County, Santa Barbara County and Ventura County, including the Cuyama Valley and Hungry Valley (near Gorman).

**Invasive Species and Level of Disturbance.** The California Invasive Plant Council has developed an Invasive Plant Inventory which rates weedy non-native plant species based on their potential to have severe ecological effects (high, moderate, limited). Three plant species rated as "high" for invasiveness was found within the biological study area; yellow star-thistle (*Centaurea solstitialis*), red brome (*Bromus madritensis* ssp. *rubens*) and cheat grass (*Bromus tectorum*). Yellow star-thistle occurs in disturbed areas within the biological study area, while red brome is common within scale-broom scrub. Cheat grass is rare within the biological study area, mostly found in scale-broom scrub. In addition, seven plant species rated as "moderate" and seven species rated as "limited" for invasiveness were found within the biological study area. Many of these species were observed within the dry low flow channel of the Cuyama

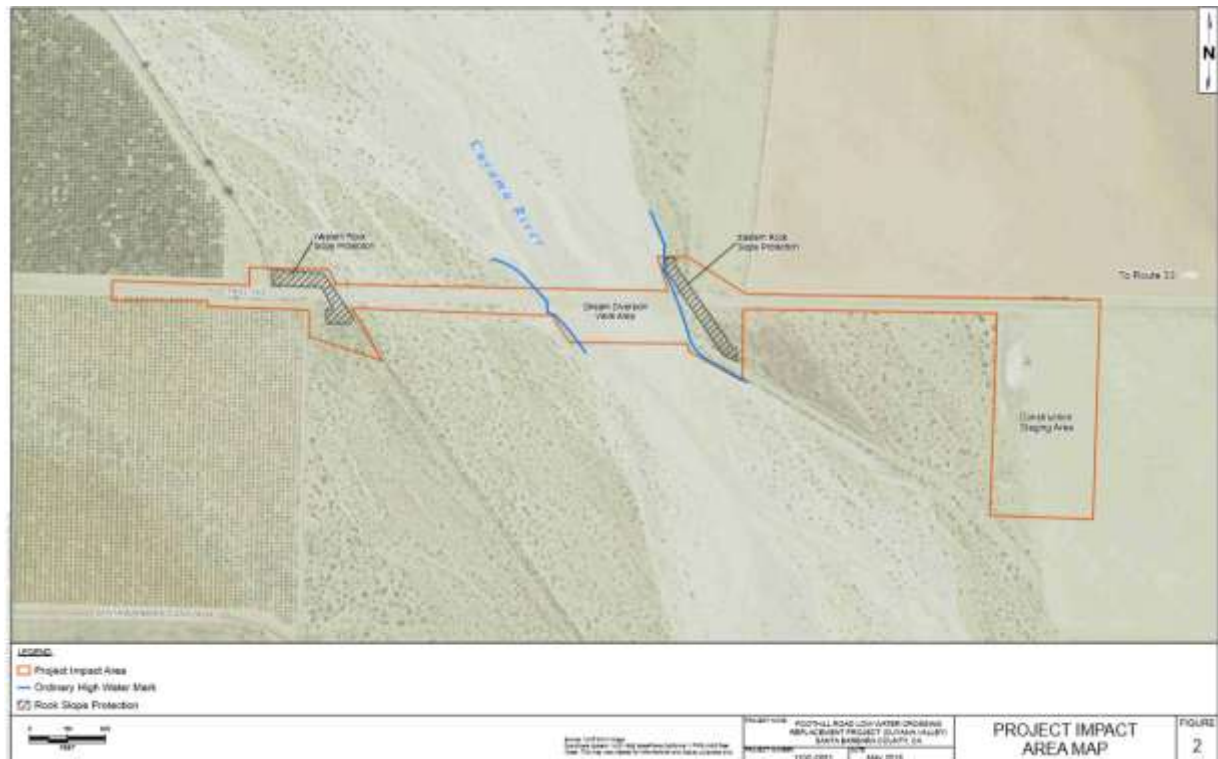


River. The biological study area has been disturbed in the past primarily by agricultural cultivation along the Cuyama River, including row crops and pistachio orchards. Occasional off-road vehicle use occurs in the riverbed within the biological study area. In addition, re-establishment of the Foothill Road crossing after flood events results in repeated disturbance of roadside areas.

### 3.4 Project Construction Impacts to Habitat

#### Project Construction Impacts to Jurisdictional Habitat areas

Disturbance to CDFW/RWQCB jurisdiction is approximately 4.2 acres and disturbance to USACE jurisdiction is approximately 2.4 acres within the 325 acres biological study area.



**3.4.1 Figure Four:** Project Impact Area Map

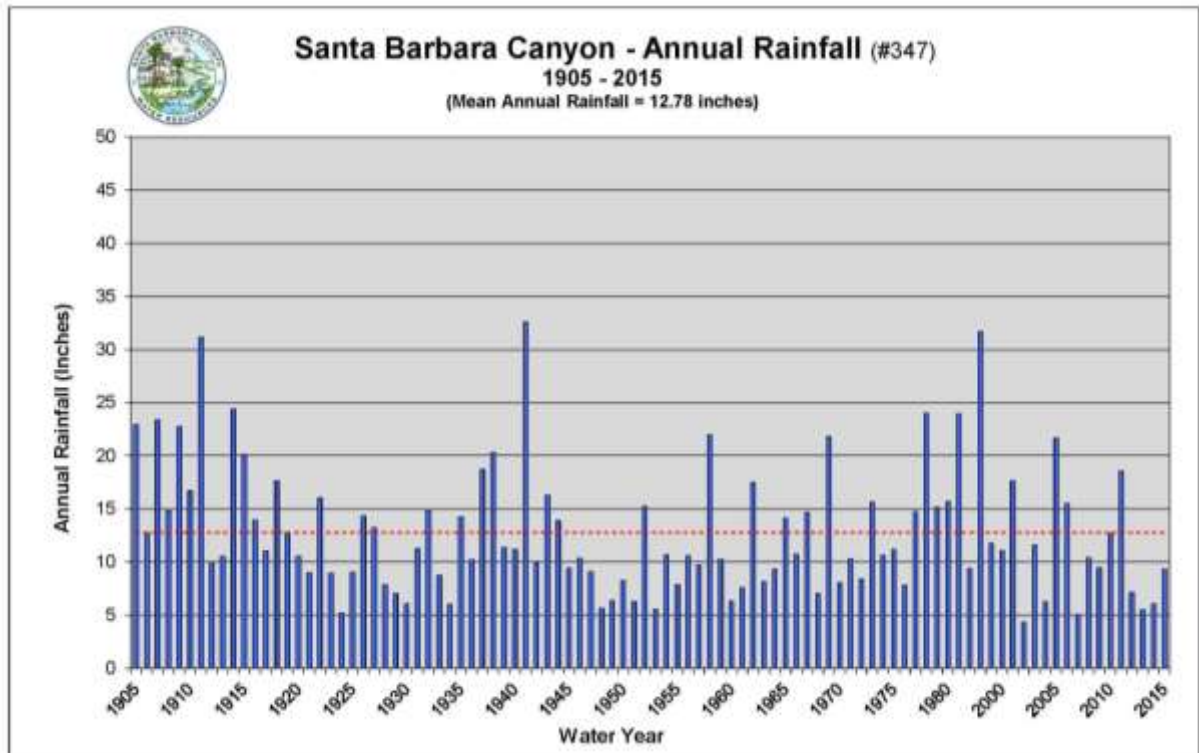
### 3.5 Climate, Rainfall and Groundwater

Based on data collected at the U. S. Geological Survey gauging station near Ventucopa (about 18 miles upstream of the project site, the upper Cuyama River is typically dry from June through September (mean monthly discharge of 1.5 cfs or less). Climate data collected at Fire Station #41 at New Cuyama indicates the average annual rainfall within the biological study area is 7.70 inches (1954-2014 data). However, rainfall recorded at Fire Station #41 during the 2010-2011 rainy season was 40 percent above normal (10.73 inches). Subsequent rainfall has been below normal; 5.09 inches in 2011-2012, 2.32 inches in 2012-2013, 1.74 inches in 2013-2014 and 5.29 inches in 2014-2015.

The closest location with many years of temperature and precipitation data is in Santa Barbara Canyon, California. This data is shown below.

## Santa Barbara Canyon, CALIFORNIA

### 1905 – 2015 Annual Rainfall Chart



**Figure Five:** Rainfall data for the Cuyama Valley area from 1905-2015, taken from the Flood Control District of Santa Barbara County Public Works.

Native plants typically germinate and grow when there is adequate moisture and when temperatures are above freezing. Thus, at the onset of the winter rainy season the result is growth and is followed by a profusion of flowers in the spring. However, during the dry summer month many native species become dormant unless they have deep tap roots or are confined to wetland areas. Precipitation and temperature are both critical factors in directing native plant growth.

## **4.0 Proposed mitigation**

### **4.1 Habitat Restoration Areas**

The proposed river bank restoration involves a combination of erosion control and enhancement measures near bridge 51C-381 along the Cuyama River. The scope of restoration with river channel banks on the east side and west side of the bridge will cover all disturbed earth on each side of the structure and along the roadway right of way. The staging area will be reseeded with a grass mixture suitable for erosion control and to return the area to its former use as a grazing area.

The entire restoration area will be re-vegetated and restored with native vegetation defined by species found within the habitat communities found within area based on the topographic delineation. The combination of native trees shrubs species from should be sufficient to provide to return the habitat area to a natural condition better then what had existed before at the end of five years for the life of the project. Additional augmentation with local native need stock may also be used depending on available seed stock quantity and through the use of native seed-based hydro-seeding.

### **4.2 Site Preparation: Compost Blanket**

Post bridge construction the restoration areas area will have a compost blanket installed. The use of compost as a Best Management Practice (BMP) has several benefits. Such as helping to prevent and reduce erosion, reduce runoff, establish vegetation and retention of a large volume of water.

Use of compost improves down-stream water quality by retaining pollutants such as heavy metals, nitrogen, phosphorus, oil and grease, fuels, herbicides and pesticides. Nutrients and hydrocarbons are absorbed and or trapped by compost are decomposed by naturally occurring microorganisms. Compost improves soil structure and nitrogen content, which reduces the need for chemical fertilizers. Compost based BMP's remove as much or more sediment from storm water as traditional perimeter controls, such as silt fences, while allowing a larger volume of clear water to pass through.

A compost blanket is a layer of loosely applied compost that is placed on the soil in disturbed areas to control erosion and retain sediment resulting from sheet flow runoff. It is used in place of sediment and erosion control tools such as mulch, netting or chemical stabilization.

### **4.3 Timing**

All planting should be done between October 1 and April 30. Ideally, once construction has been completed all plantings should be done after the first wetting rains between October 1 and February 1 to take full advantage of the winter rainy season, dormancy of foliage and rooting period to ensure optimal survival of plantings. The fall months in California are comparable to

early spring in the rest of temperate North America. At this time soils are still warm but not too hot for tender new roots. Capillary movement of water is upward, toward the soil surface. Nights are cool, promoting less shoot growth and more root growth while the days are relatively cool, leading to less stress on new plantings. These cooler conditions are less favorable to many soil-borne pathogens that infect roots systems which are broken or damaged during planting,

#### **4.4 Plant Pallet Sources**

To the extent feasible, all tree and shrub stock will be grown from cutting and seed stock obtained from the south coast area of Santa Barbara County. All replacement tree stock, which cannot be grown from cutting or seeds, shall be obtained from a native plant nursery, be ant free and shall not be inoculated to prevent heart rot. The operator shall provide a list of all material which must be obtained from other than onsite sources. All plant materials will be provided by one or more of the following local native plant nurseries: San Marcos Growers (805) 683-1561, Matillija Nursery (805) 523-8604, Las Pilitas Nursery (805) 438-5992, Growing Solutions (805) 452-7516, Santa Barbara Natives (805) 729-3855, Santa Barbara Botanical Garden, (805) 682- 4726. All plant material (cutting and seed source) will be from the Santa Barbara County area.

Plant material in containers larger than one-gallon cans should be avoided. All container plants will be planted as shrubs to allow for deep mulching and to provide an established root mass. Table 4.4.1 below lists the species, quantities and container sizes of trees and shrubs that will be planted.

#### 4.4.1 Plant Species Pallet

<b>Foothill Road Bridge Plant List</b>				
			<b>Size</b>	<b>Quantity</b>
<b>Shrubs</b>				
California desert tea	<i>Ephedra californica</i>		1 gal	200
Burro brush	<i>Ambrosia salsola</i>		1 gal	200
California match-weed	<i>Gutierrezia californica</i>		1 gal	200
California brickellbush	<i>Brickellia californica</i>		1 gal	200
Scale Broom	<i>Lepidospartum squamatum</i>		1 gal	200
Interior golden-bush	<i>Ericameria linearifolia</i>		1 gal	100
California Buckwheat	<i>Eriogonum foliolosum</i>		1 gal	600
Rubber Rabbitbrush	<i>Ericameria nauseosa</i>		1 gal	600
Big Sagebrush	<i>Artemisia tridentata</i>		1 gal	600
Chaparral Yucca	<i>Hesperoyucca whipplei</i>		1 gal	100
Valley cholla	<i>Cylindropuntia californica</i> var. <i>parkeri</i>		1 gal	100
			total	3100
<b>Invasive Removal</b>	<b>Method</b>	<b>Area</b>		
Tamarisk	excavator or cut by hand	TBD		



## **4.5 Planting locations**

Tree plantings will be placed approximately 20 feet apart to allow for future growth. Shrubs will be planted in groupings of the same species and will be spaced approximately 10 feet apart. Shrubs will be planted in groups three feet apart to create natural appearing clusters of vegetation comprised of species that occur in an undisturbed habitat. Plantings will be designed to copy natural associations of plant species found in a natural undisturbed desert tea scrub habitat.

### **4.5.1 Plantings locations and species by topographic zone delineation.**

The elevation of the project area varies from approximately 2,460 to 2,520 feet above mean sea level. Two distinct plant zones are established based on topographic position and inundation tolerance. The two zones are the Upper Floodplain Zone (UFZ) and Riverbed Zone (RBZ). The topographic position of these two areas does not exceed 10 feet in elevation from one side of the Cuyama River channel to the other.

The UFZ range is dominated by California Desert Tea Scrub (DS). This community occurs in sandy areas along the Cuyama River, mostly in areas that are rarely inundated. The majority of the planting areas will occur in the area as it is more resistant to flash flooding and episodic erosional events due to the width of the river channel.

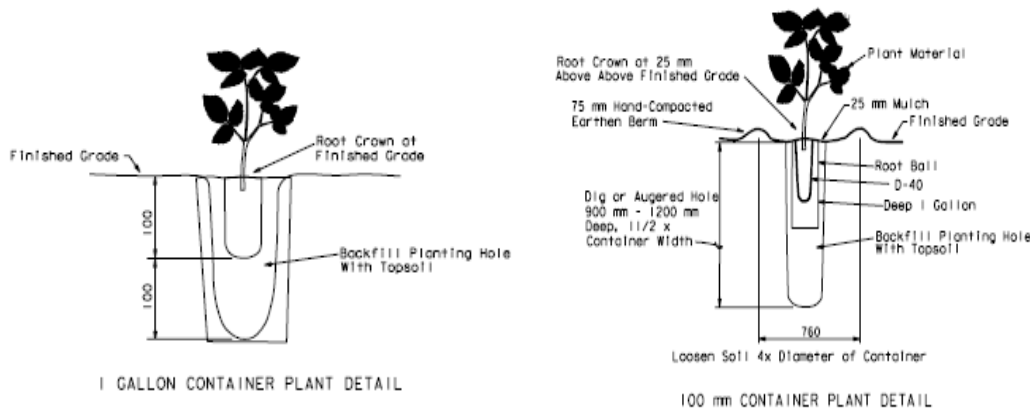
The RBZ is a Scale-broom Scrub (SS) vegetation community. This community occurs along the margins of the low flow channel of the Cuyama River, in areas that are only occasionally affected by storm-related erosion.

### **4.5.2 Planting plan and procedure for container plants**

Planting holes will be dug by hand with a posthole digger or by mechanical methods such as an auger at least twice as deep and wide as the container size. While the plant is still in the container, the root ball will be thoroughly wetted. The plant will then be removed from the container. If the taproot has begun to encircle the container, the roots will be cut back to a single taproot. For most native revegetation projects, soil amendment is not recommended. The soil should be soft and friable. Large rocks and clods should be removed from planting hole backfill soil. If the supervising biologist calls for soil amendment, a mix of approximately one-third composted or nitrolized forest humus to two-third native soil should be blended and used as backfill. Prior to placement of the plant into the planting hole, fill the hole with water, which will be allowed to percolate into the subsoil. Some of the backfill material will then be spilled in the planting hole, moistened, and tamped to form a mound in the bottom of the planting hole. With water flowing slowly from the hose into the hole, more backfill material will be placed into the hole, up to about two-thirds of the height of the root ball. The backfill material

will be moistened, tamped, and set all around. The position of the plant, relative to finished grade, will be rechecked to be sure that the collar is still above grade. The remaining portion of the planting hole surrounding the root ball will be filled with backfill material. An irrigation basin berm 2 to 3 feet outside the dimension of the trunk will be created using the remaining backfill and soil. Coarse, organic, weed-and disease-free mulch will be applied at least one-inch deep. The exposed collar and inside the entire basin area will be top-dressed. Once planting is complete, the plant will be irrigated from the top, filling the irrigation basin and sprinkling the surrounding area to settle backfill, mulch, and berm. Plants will be deep-watered once per week through the first 3 to 5 months following planting, unless frequent rainfall makes deep-watering unnecessary. Weeding will be conducted as needed to reduce competition with non-native species.

#### 4.5.3 Figure Five: Diagram for planting container plants.



## 4.6 Irrigation

A temporary irrigation system will be installed with irrigation control valves and drip emitters. Two gallon per-hour drip emitters will be used for all smaller shrubs and two gallon per-hour emitters will be used for all large shrubs and trees. Supplemental watering will need to be performed at least once a week for three or five months until the plants have become established. Once the plantings are established watering should become bi-weekly, for at least a two-year maintenance period. All plantings shall be irrigated by drip irrigation for at least a two-year maintenance period. Irrigation shall be phased out during the winter of the second year unless unusually severe conditions threaten survival of the planting. After irrigation is removed all plantings must survive and grow for at least three years without supplemental irrigation.

## **5.0 Maintenance**

### **5.1 Weed control**

Eradication measures to control exotic weeds on site shall be primarily conducted by hand. Weed removal will be required to aid the establishment of the newly install plants during the maintenance period. Weed removal will need to be performed once a month for the first three or four months and then every other month thereafter until the end of the first year. In the remaining period weed control will be performed twice yearly, once in the spring and once in the fall.

A site-specific weed control Environmental Assessment (EA) and a Pesticide Use Permit (PUP) must be completed before any use of pesticides on BLM lands. This can be a lengthy process and requires specific information, public notification, and review by the BLM State Office. Any use of pesticides shall comply with all applicable Federal and State laws. Pesticides shall only be used in accordance with their registered uses, must be on the list of pesticides approved for use on California BLM lands, and used within limitations imposed by the Secretary of the Interior. Applicators of herbicides must have completed pesticide certification training and have a Certified Pesticide Applicator's License. A Pesticide Use Report (PUR) must be completed within 48 hours of all herbicide applications and pesticide application records for the areas and acres treated must be submitted to the Authorized BLM Officer each year.

Given the tenacity of some weeds the preferred hand pulling removal method may not be effective. If the restoration contractor acquires a weed control EA and PUP, applications of herbicide may be used. Spot applications of Aquamaster™, a glyphosate herbicide registered by the Environmental Protection Agency for use in flowing streams and creeks may be needed. Only herbicides approved for use near creeks and streams will be used. **Surfactant LI700, Agri-Dex** shall not be used on site.

Herbicide application shall only be used as a last result to eliminate stubborn weeds that cannot be eliminated by hand. Repeated spot applications may be necessary during the maintenance period.

### **5.2 Irrigation System**

The temporary irrigation system with irrigation hose, including control valves, drip emitters and shall be functional for a minimum of the entire two-year maintenance period. The entire systems should be field inspected to check for leaks caused by chewing of rodents or material failure. Field inspections should occur bi-weekly for three or four months until the plants have become established and then monthly for the duration of the two-year maintenance period. System field inspections will allow the maintenance contractor to determine if supplemental

watering will be needed and if severe conditions threaten survival of the planting. The temporary irrigation system shall be removed from the project site when the restoration portion of the project is completed.

## **6.0 Performance measures**

Performance standards are measure of how well a project is meeting the goals and objectives of the plan. The mitigation goal is to return native vegetation top of bank and bank area after the construction of Bridge 51C-0381 replacement project. The proposed on-site revegetation area is slightly larger than 2.0 acres or 88,321 square feet in size and is composed of the two areas on each side of the bridge.

### **6.1 Success criteria**

This planting plan requires that all planting shall achieve a minimum survival rate. All planting shall have a minimum survival rate of 80% for the first year, and a 50% survival rate of five years at the end of the project.

In order for this plan to be deemed successful, the additional three performance measures shall be met.

- 1) All plants must survive and grow for at least two years without supplemental water for the restoration phase of the project to be eligible for acceptance.
- 2) No single species shall constitute more than 50% of vegetation cover.
- 3) No woody invasive species shall be present, and herbaceous invasive species shall not exceed 5% cover.

If minimum survival rate is not achieved then the County shall be responsible for taking corrective measures.

## **7.0 Mitigation monitoring**

The County shall ensure that the maintenance, monitoring and reporting activities are over seen by a specialist familiar with restoration of native plants. The purpose of this monitoring is to document implementation of the habitat restoration plan and revegetation performance measures.

### **7.1 Monitoring Methodology**

Monitoring will be performed by visually inspecting the site and recording qualitative site conditions and quantitative measures of performance in the restoration area.

Qualitative observations in the restoration area shall include human or other disturbance, wildlife activity, soil conditions, and activities adjacent to the project site that affect or may in the future affect the site.

Quantitative measurements will include an accounting of all trees and shrubs planted in the restoration area and mortality rates. A visual estimate of weed cover will also be conducted. Cover estimates shall measure the aerial extent of unvegetated ground, shrub and weed cover. Monitoring reports will include identification of plant species within the re-vegetation areas, and photographs from established key view locations and documenting need for additional maintenance.

## **7.2 Schedule**

Monitoring shall be performed weekly in the first two weeks, then monthly for three months, and then quarterly for the next 12 months, unless success criteria are met earlier. After the first year, trees and shrub species will be monitored annually in spring for a period of five years or until the success criteria has been achieved.

## **7.3 Reporting**

An annual report shall be submitted to USACE/CDFW by January 1 and the RWQCB by May 15 of each year for 5 years after planting. This report shall include the survival rate of both trees and shrubs. The number of species of plants replaced, an overview of the revegetation and exotic plants control efforts and the methods used to assess these parameters shall also be included. Photos from designated photo stations shall be included.

## **8.0 Contingency Measures**

If plant survival rates have not been met, there shall be contingency measures to ensure the success criteria of the restoration plan. The contingency measures require that the County approved maintenance contractor shall replant to a level to achieve the plan requirements. The county will adopt an adaptive management strategy as a tool for dealing with unexpected situations or methodologies which are beneficial or have a negative impact on the restoration project.

## **9.0 References**

Andersen, Caitlin. Dobrowski, Bridget. Harris, Melissa. Moreno, Edith. Roehrdanz, Patrick. Conservation Assessment for the Cuyama Valley: Current Conditions and Planning Scenarios. June 2009.



Bronstein, Carol; Fross, David; O'Brien, Bart. California Native Plants for the Garden. Cachuma Press Los Olivos, California. 4<sup>th</sup> printing 2007.

California Department of Fish and Game. Maintenance agreement regarding proposed stream or lake alteration (notification No. 1600-2013-00XX-R5) XXX, 2013.

California Exotic Plant Control Center.

(<http://www.calipc.org/ip/inventory/pdf/Inventory2006.pdf>).

County of Ventura, Planning Division. Guide to Native and Invasive Streamside plants, Restoring Riparian Habitats in Ventura County and along the Santa Clara River in Los Angeles County. May 2006. ([http://www.ventura.org/planning/pdf/prog\\_servs/bio\\_resources/webRipPlntGde1.pdf](http://www.ventura.org/planning/pdf/prog_servs/bio_resources/webRipPlntGde1.pdf)).

McRae, B.H., Dickson, B.G., Keitt, T.H. & Shah, V.B. 2008. Using circuit theory to model connectivity in ecology, evolution, and conservation. *Ecology*. 89(10): 2712-2724.

United States Department of Agriculture, Natural Resources Conservation Service (NRCS). (<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>).

United States Fish and Wildlife Service, Species list for Federal Endangered and Threatened Species that may be affected by projects in Santa Barbara County. ([http://www.fws.gov/ventura/es/spplists/species\\_sba.cfm](http://www.fws.gov/ventura/es/spplists/species_sba.cfm))

University of California at Berkeley, Cal photos: Plants, a digital image library of plants species. (<http://calphotos.berkeley.edu/flora/>).

Wilcox, Glen. Snieckus, Robert. Randell, Gary. Riparian Revegetation in California, USDA Soil Conservation Service. 1984 (p. 26).

## 10.0 Appendix One Seed Mix Pallet for Foothill Road Bridge 51C-381

Desert tea (*Ephedra californica*)  
Annual bur-sage (*Ambrosia acanthicarpa*)  
Burro brush (*Ambrosia salsola*)  
Tarragon (*Artemisia dracunculus*)  
Big sagebrush (*Artemisia tridentata*)  
California brickellbush (*Brickellia californica*)  
Yellow pin-cushion (*Chaenactis glabriuscula* var. *glabriuscula*)  
Encelia (*Encelia actoni*)  
Interior golden-bush (*Ericameria linearifolia*)  
Rubber rabbit-brush (*Ericameria nauseosa*)  
California match-weed (*Gutierrezia californica*)  
Telegraph weed (*Heterotheca grandiflora*)  
California goldfields (*Lasthenia californica* ssp. *californica*)  
Scale-broom (*Lepidospartum squamatum*)  
Bigelow's coreopsis (*Leptosyne bigelovii*)  
Valley lessingia (*Lessingia glandulifera* var. *glandulifera*)  
Desert dandelion (*Malacothrix glabrata*)  
Pineapple weed (*Matricaria discoidea*)  
Slender cottonweed (*Micropus californicus* var. *californicus*)  
Douglas' thread-leaf ragwort (*Senecio flaccidus* var. *douglasi*)  
Stephanomeria (*Stephanomeria exigua*)  
Silver puffs (*Uropappus lindleyi*)  
**BORAGINACEAE (Borage Family)**  
Rancher's fireweed (*Amsinckia menziesii* var. *intermedia*)  
Cryptantha (*Cryptantha circumscissa*)  
Cryptantha (*Cryptantha intermedia* var. *intermedia*)  
Cryptantha (*Cryptantha muricata*)  
Whispering bells (*Emmenanthe penduliflora* ssp. *Penduliflora*)  
Thick-leaved yerba (santa *Eriodictyon crassifolium*)  
Narrow-toothed (*pectocarya Pectocarya linearis* ssp. *ferocula*)  
Round-nut (*pectocarya Pectocarya setosa*)  
Caterpillar phacelia (*Phacelia cicutaria*)  
Phacelia (*Phacelia suaveolens*)  
Phacelia (*Phacelia tanacetifolia*)  
**CACTACEAE (Cactus Family)**  
Valley cholla (*Cylindropuntia californica* var. *parkeri* )  
**CUCURBITACEAE (Gourd Family)**  
California man-root (*Marah fabaceus*)  
**ERICACEAE (Heath Family)**  
Big-berry manzanita (*Arctostaphylos glauca*)  
**FABACEAE (Legume Family)**

California broom (*Acemisson glaber*)  
 Deer-weed (*Acemisson wrangelianus*)  
 False indigo (*Amorpha californica* var. *californica*)  
 Douglas' milk-vetch *Astragalus douglasii* var. *douglasii*  
 Gambel's dwarf milk-vetch (*Astragalus gambelianus*)  
 Freckled milk-vetch *Astragalus* (*lentiginosus* var. *nigricalycis*)  
 Silver lupine (*Lupinus albifrons* var. *albifrons*)  
 Bajada lupine (*Lupinus concinnus*)  
 Chick lupine (*Lupinus microcarpus* var. *horizontalis*)  
**ONAGRACEAE (Evening Primrose Family)**  
 Evening primrose (*Camissonia campestris*)  
 Sun cup (*Camissoniopsis confuse*)  
 Evening primrose (*Eremothera boothi*)  
 Mustard evening primrose (*Eulobus californicus*)  
 California evening-primrose (*Oenothera californica* ssp. *californica*)  
**PAPAVERACEAE (Poppy Family)**  
 Prickly poppy (*Argemone munita*)  
 California poppy (*Eschscholzia californica*)  
**PLANTAGINACEAE (Plantain Family)**  
 Scarlet bugler (*Penstemon centranthifolius*)  
**POLEMONIACEAE (Phlox Family)**  
 Woolly-star (*Eriastrum densifolium* ssp. *Elongatum*)  
 Many-flowered (*eriastrum Eriastrum pluriflorum* ssp. *Pluriflorum*)  
 Hoover's (*eriastrum Eriastrum hooveri*)  
 Blue-head gilia (*Gilia capitata* ssp. *Abrotanifolia*)  
 Cuyama gilia (*Gilia latiflora* ssp. *Cuyamensis*)  
 Leptosiphon (*Leptosiphon liniflorus*)  
**Navarretia (Agave Family)**  
 Chaparral yucca (*Hesperoyucca whippleivarretia atractyloides*)