Attachment 7: Dos Pueblos Creek Restoration, Maintenance, and Monitoring Plan

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN




JUNE 2015

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Dos Pueblos Creek
RESTORATION, MAINTENANCE, AND MONITORING PLAN

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EXECUTIVE SUMMARY

This Dos Pueblos Creek Restoration Plan (Restoration Plan) outlines on-site riparian restoration, and enhancement activities proposed to restore functions and services along disturbed portions of Dos Pueblos Creek (i.e., Restoration Areas), as part of the proposed Dos Pueblos Creek Restoration Project (Project). The Project is located along the Gaviota coastline in the County of Santa Barbara, California. This Restoration Plan presents information on project location, proposed creek improvements, project modifications resulting from the proposed creek restoration work, assumed permitting requirements, proposed restoration strategies, planting recommendations, long-term maintenance requirements, long-term monitoring methodology, and ultimate success criteria and performance standards.

The proposed Project is intended to restore native riparian creek habitat and improve conditions suitable for fish passage within the Restoration Areas. Restoration of the riparian corridor is expected to yield improvements to riparian functions and services through beneficial modifications to existing road/creek crossings, other physical barriers to fish passage, and sustainable agricultural practices within the watershed. For the purposes of this Restoration Plan, riparian habitat refers to riparian vegetation and the animal species that require or utilize these habitats.

To ensure that the proposed creek restoration efforts are implemented successfully, the Project includes the removal of numerous man-made obstructions and barriers to fish passage, replacement with grade control structures more conducive to fish passage, as well as the improvement of the geomorphology within the creek by removing sediment, installation of bio-retention facilities for sediment capture to improve water quality, restoring beneficial creek bed conditions, and removing non-native vegetation from the creek channel, banks, and margins. The Restoration Areas will be restored to appropriate riparian vegetation, depending upon location where restoration work is proposed.

The Project would result in temporary impacts to the riparian corridor including existing native riparian habitat situated within the Restoration Areas. Impacts to the riparian corridor will likely result from improvements associated with modifications to, or elimination of existing farm access road creek crossings, modifications to the Caltrans Hwy 101 bridge drop structure, and modifications to the agricultural water diversion structure at the upstream extent of the Restoration Areas. It is anticipated that all impacts would be temporary, and will result in a restored creek system of higher quality than currently exists, thus these impacts are deemed necessary to facilitate the Restoration Plan.

Riparian habitat within the Restoration Areas are subject to regulation by the following resource agencies: U.S. Army Corps of Engineers (ACOE) pursuant to Section 404 of the federal Clean Water Act (CWA); Regional Water Quality Control Board (RWQCB), pursuant to Section 401 of the federal

CWA and Porter-Cologne Water Quality Control Act; and the California Department of Fish and Wildlife (CDFW), pursuant to Section 1602 of the California Fish and Game Code, the U.S. Fish and Wildlife Service (USFWS) and the California Coastal Commission (CCC), pursuant to the California Coastal Act (within areas of retained jurisdiction at the mouth of the creek). In addition, portions of the Project located in the Coastal Zone (i.e., basically south of the Hwy. 101 bridge crossing) are subject to coastal development permit requirements as implemented by the County of Santa Barbara pursuant to the certified Local Coastal Plan, which are appealable to the CCC.

Restoration activities will include the removal of portions of degraded concrete channel lining and previous man-made vertical creek obstructions, construction of new fish access structures, cleanout of sediment and non-native vegetation from portions of the creek channel and adjacent creek margins at selected locations, modifications to the existing agricultural diversion structure, re-establishment of natural creek flow areas and overall enhancement of creek bed and creek bank surfaces. These areas will only be disturbed during construction, as they will be restored and revegetated with riparian species following the disturbances. The areas will be actively revegetated and will also be allowed to naturally recruit/revegetate with additional volunteer native riparian species (i.e., primarily within the creek beds and immediate creek banks), where indicated.

The Project will include the restoration and enhancement of riparian habitat areas, coupled with the preservation of existing riparian habitat. The proposed Restoration Plan includes the following:

1. The restoration of arroyo willow thicket and riparian woodland through the conversion of existing non-native, ornamental, eucalyptus and giant reed (*Arundo donax)* areas within the current creek area and adjacent creek banks. These areas will be replanted with appropriate native riparian vegetation with due consideration of the stability of the adjoining channel.
2. The enhancement of existing disturbed willow thicket and riparian woodland areas within the creek channel through the removal of non-native exotic/invasive species, ornamental species and revegetation with appropriate native riparian species.

1 INTRODUCTION

This Dos Pueblos Creek Restoration Plan (Restoration Plan) outlines on-site riparian habitat restoration and enhancement activities proposed to restore riparian functions and services along disturbed portions of Dos Pueblos Creek, as part of the proposed Dos Pueblos Creek Restoration Project (Project). The project is associated with the Inland Development Agreement approved by the County of Santa Barbara as part of the Dos Pueblos Ranch and Santa Barbara Ranch properties. This Restoration Plan presents information on project location, proposed creek improvements, project disturbances resulting from the proposed creek restoration work, assumed permitting requirements, proposed on-site restoration/revegetation strategies, planting recommendations, long-term maintenance requirements, long-term monitoring methodology, and ultimate success criteria.

1.1 Project Location

The Project is located west of Goleta along the Gaviota coastline and is situated along the Dos Pueblos Canyon Creek drainage from the Pacific Ocean inland to approximately the Los Padres National Forest boundary. The Project study area encompasses valleys and canyon bottom habitats along an approximate 3-mile stretch of Dos Pueblos Creek (Figures 1 and 2). The Project is located in the Dos Pueblos Creek Watershed Area, including drainages from the Transverse Range of the Santa Ynez Mountains to the Pacific Ocean (Figure 3).

1.2 Project Background

Preparation of this Restoration Plan is a component of the Inland Development Agreement tied to the entitlement of the Santa Barbara Ranch project (SBR), including portions of Dos Pueblos Ranch (DPR), which received development approval from the County of Santa Barbara (County) on October 21, 2008. The preparation of a Creek Restoration Plan was a component of the Inland Development Agreement (IDA).

This Restoration Plan is based upon information previously collected by Impact Sciences in November 2010, at which time Impact Sciences biologists assessed the overall condition of Dos Pueblos Creek drainage and identified potential Restoration Areas associated with previous creek disturbances and built improvements. Dudek utilized and expanded upon this previous information as a starting point for the further studies completed in support of this current effort, focusing on the disturbance areas identified in the Impact Sciences report. Dudek and Balance Hydrologics staff conducted site investigations along the Dos Pueblos Creek drainage area on March 10th and 11th, 2015. The observations and data collected during those visits, as well as subsequent project research, are summarized herein. This Restoration Plan is not intended to be an all-inclusive evaluation of the entire creek reach, but is rather focused on the areas of past disturbance that have been previously identified as potential areas for creek restoration. Information presented herein regarding the overall creek conditions

are based upon assumptions made from observations at the various disturbance areas and from visual observations of general creek conditions upstream and downstream from these locations.

Dos Pueblos Canyon Creek and the associated riparian woodland in many areas is relatively undisturbed and have been known to have historically supported a population of southern steelhead (*Oncorhynchus mykiss*), which were observed at the upstream portions of the creek by Impact Sciences and others. Southern steelhead have been previously documented as having historically utilized the creek, although conditions within the creek have degraded over time, and it is currently believed that the degraded creek habitat and the various man-made obstructions within the creek may preclude southern steelhead passage and general habitat utilization. This Restoration Plan presents restoration solutions to improve the southern steelhead habitat conditions and restore some of the historic creek habitat functions.

1.3 Project History and Land Use

The Dos Pueblos Canyon Creek watershed was originally the home of Native American tribes who established villages on either side of Dos Pueblos Creek and utilized the resources of the area. In more recent history, the Dos Pueblos Creek drainage and adjacent lands have supported farming and agricultural activities ranging from row crops to orchards including citrus, avocado, macadamia nut and Cherimoya fruit trees. The majority of the creek drainage north of the Hwy. 101 bridge crossing has been under the ownership and management of the Schulte Family and more recently the Dos Pueblos Ranch Holdings, LLC. A small portion of the creek drainage south of Hwy. 101 has been under the ownership of the Dos Pueblos Ranch and incorporates single family residential ownership, agriculture and aquaculture uses.

The creek area south of the Hwy. 101 bridge is highly disturbed by past land uses and alterations of the creek channel including a concrete grade control structure located underneath the Hwy. 101 bridge. Concrete lined channel portions of the creek lie south of the La Casa Grande bridge crossing, and are configured in relationship with the beach access road and recreational areas previously developed along the beach. In addition, this downstream portion of the creek, while still supporting a mature over-story canopy of native riparian tree species, has been compromised by dense non-native ornamental invasive tree species, as well as an extensive understory of non-native plant growth, which has displaced much of the desirable native understory vegetation.

The majority of the creek north (upstream) of the Hwy. 101 bridge retains a fairly natural state, however, modifications to the natural creek channel have resulted from historic farm road crossings, water diversions for agricultural use, and grade control drop structures for erosion control purposes.

SOURCE: Shaded Relief

FIGURE 1

Regional Map

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DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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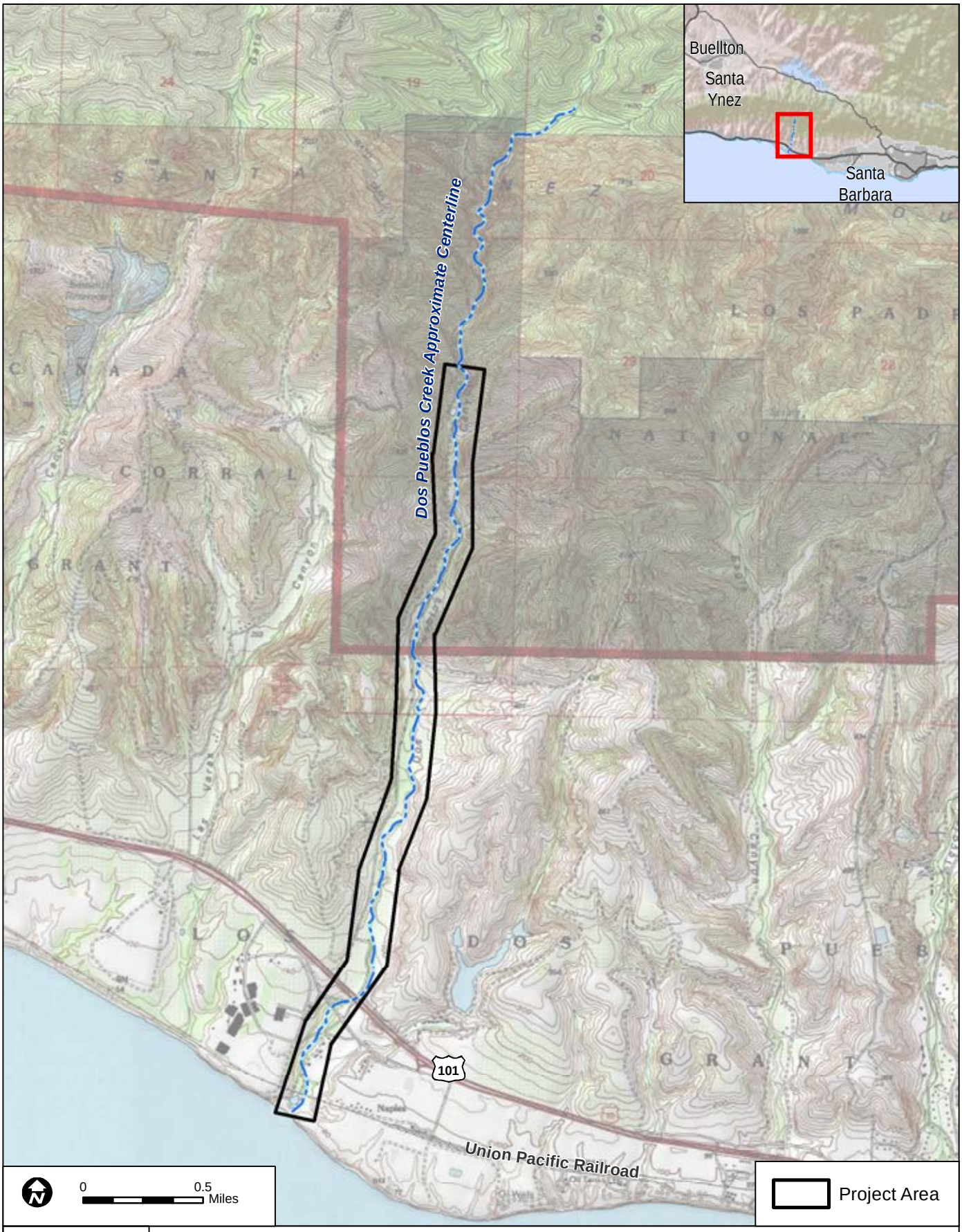

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SOURCE: USGS Topo 7.5 Minute Series Dos Pueblos Canyon Quadrangle
Township 4N / Range 29W / Sections 06-07, Township 4N / Range 30W / Section 12,
Township 5N / Range 29W / Sections 30-31

FIGURE 2
Vicinity Map

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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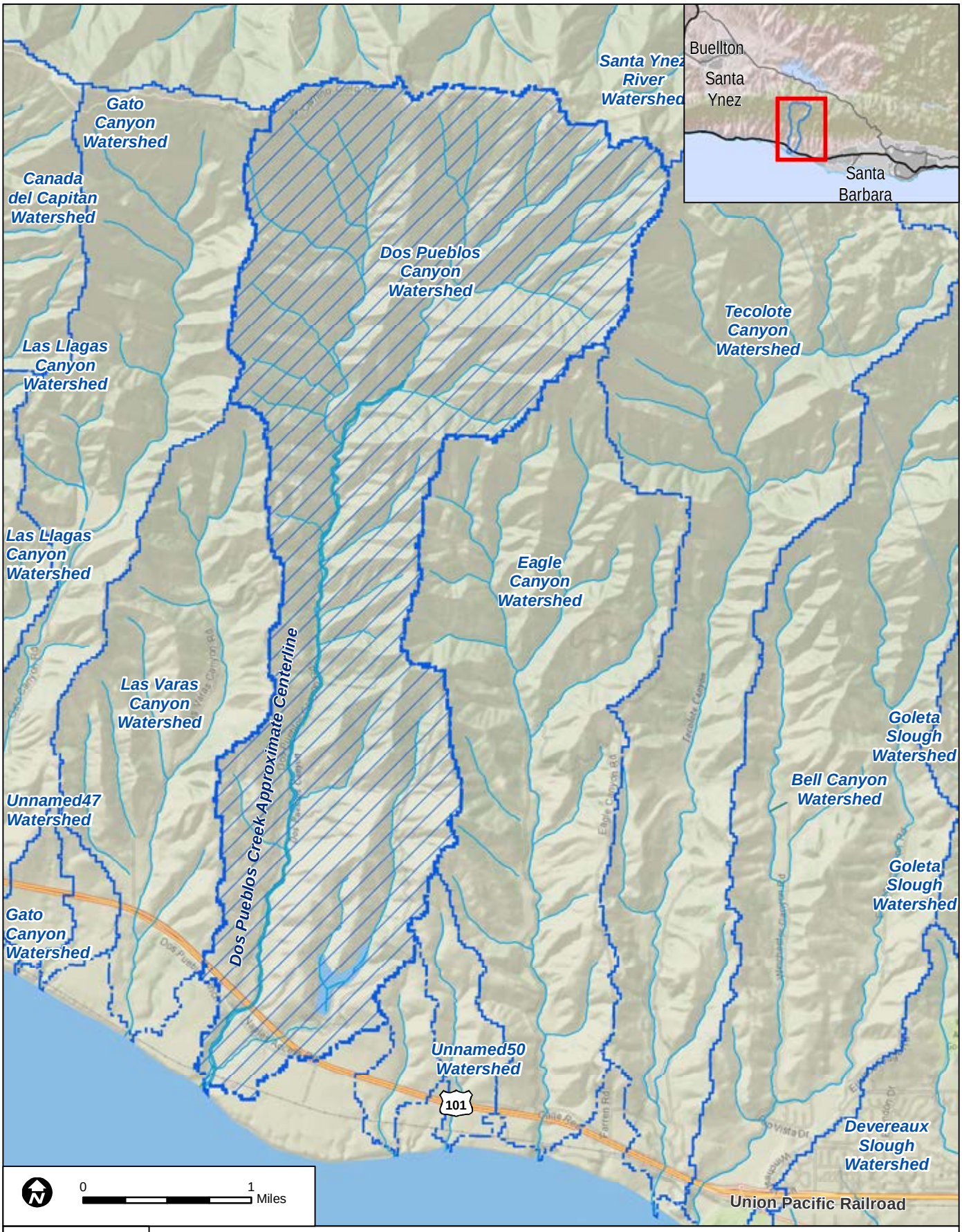

SOURCE: National Geograhpic World Map 2014

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FIGURE 3

Watershed Area Map

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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1.4 Responsible Parties

This Restoration Plan has been prepared by Dudek on behalf of the California Rangeland Trust (Rangeland Trust), in collaboration with Standard Portfolios Asset Management Co, LLC ("Standard Portfolios"), which currently owns the Santa Barbara Ranch property. SBRHC, Inc. is currently the Developer under the terms of the IDA pending Santa Barbara County approval of a transfer of SBRHC, Inc.'s obligations as the Developer in the IDA to Standard Portfolios. SBRHC has authorized Standard Portfolios to perform the Developer's obligations in its stead until such time as the County consents to the Transfer Agreement. In that capacity Standard Portfolios is the entity responsible for carrying out the obligations of the Developer under the IDA. The representatives for Standard Portfolios are: Greg Garmon (Standard Portfolios Asset Management Co, LLC), Matthew K. Osgood (Vintage Pacific Holding Company and consultant to Standard Portfolios) and Stanley W. Lamport (Cox, Castle & Nicholson LLP and legal counsel). In accordance with the IDA, in 2009 the Developer under the IDA at that time contributed one hundred thousand dollar ($100,000) to the Rangeland Trust to initiate preparation of the Restoration Plan. In addition, pursuant to the IDA, prior to commencement of grading for the Inland Development of Santa Barbara Ranch, the Developer under the IDA is also responsible for paying a future, fixed payment in the amount of three hundred thousand dollars ($300,000) to a non-profit conservation organization of the Developer's choice to be used for implementation of the Restoration Plan. It is recognized that the future, $300,000 contribution to will provide "seed money" to initiate the Project, and that additional funding for project implementation may be obtained through grants. It is expected that Project implementation may be phased to accommodate funding availability.

Rangeland Trust is a non-profit conservation organization with substantial experience in conserving open space and/or natural resources, and is currently responsible for overseeing the engagement of Dudek to plan and prepare the Restoration Plan in accordance with the IDA. The representative contact at Rangeland Trust is Marshall Cook, Transaction Director.

Rangeland Trust retained Dudek to prepare the Restoration Plan. The representative contacts at Dudek are Ken Marshall (Principal Planner and Regional Office Manager), and John Minchin (Habitat Restoration Specialist/Landscape Architect #2555). Balance Hydrologics, serving as a sub-consultant to Dudek, provided hydrology and geomophology consulting, represented by Denis Ruttenberg, P.E. (Engineer/Hydrologist).

The responsible party for implementation, maintenance and monitoring of the Project will be a qualified nonprofit conservation organization of the Developer's choice which meets the criteria for the selection of such an organization in Section 2.02(a) of the IDA.

The Restoration Areas will be accessible to permitting agencies throughout the project review and permitting phase, as well as during the installation and five-year maintenance and monitoring period. All necessary authorizations for site access will be obtained from the affected properties owners.

2 PROJECT DESCRIPTION, OBJECTIVES AND SITE EVALUATION

2.1 Project Description and Creek Characteristics

The Restoration Plan represents a comprehensive stream restoration effort with a focus on restoration of riparian system functions and services and improving riparian habitat within Dos Pueblos Creek. The overall goal is to enhance the areas of natural, scenic, wildlife, biological, open space, and drainage corridors within Dos Pueblos Creek consistent with ongoing agricultural use on lands within the Dos Pueblos Creek drainage. An objective of the project is to restore disturbed portions of the creek to more natural conditions, so that physical conditions of the creek promote southern steelhead migration from the Pacific Ocean inland to the upper more intact reaches of the creek. Through the design and implementation of the creek restoration improvements, the Project will help provide improved creek aquatic habitat and hydrology functions, as well as improved native riparian habitat functions and services.

The current observed condition of Dos Pueblos Creek presents evidence of significant channel down-cutting and bank erosion, along with fine sediment accumulation, which has occurred in numerous locations along the creek reach. This is likely the result of natural causes, resulting from upstream soil instability and geologic faulting, as well as from man-made disturbances from adjacent farming and agricultural operations which have occurred over many decades. Numerous sections of the creek have been previously stabilized for both road crossings, to reduce erosion and stabilize creek banks and bed, and control changes in creek elevation. There are also several locations where agricultural diversions have accessed the available creek flow per previous water use agreements. These hydrology modifications have affected the natural flow regime within the creek. Sedimentation has also occurred along the creek due to natural causes, as well as from apparent agricultural runoff and drainage discharge entering the main creek from secondary tributaries and farm drainages.

Some portions of the creek carry perennial flow, while other sections are dry. The majority of the creek supports a fairly mature native riparian over story canopy of trees, with an extremely dense understory of native, as well as non-native shrub and ground cover species. Significant accumulations of non-native vegetation debris are present within the creek channel areas, particularly within the southerly reaches of the creek below the Caltrans Hwy 101 bridge crossing. Sedimentation accumulation is associated with vegetation blockage along many portions of the creek. These conditions have resulted in localized damming of creek flow in many locations. Some constructed structures within the creek channel create vertical barriers for fish passage. Due to the accumulation of sediment and dense vegetative cover, the current creek conditions do not support conditions suitable to southern steelhead passage.

2.2 Project Goals and Objectives

The Santa Barbara Ranch project (SBR), including portions of Dos Pueblos Ranch (DPR), received development approval from the County of Santa Barbara on October 21, 2008. A key term in the IDA regarding SBR was "to initiate planning to enhance areas of natural, scenic, wildlife, biological, open space, and drainage corridors within Dos Pueblos Creek consistent with ongoing agricultural use on lands within the Dos Pueblos Creek drainage. IDA Section 2.02(a) requires that a qualified non-profit conservation organization use its best faith efforts to prepare a Creek Restoration Plan within one (1) year after the effective date of the IDA. Consistent with the terms of the IDA, this Restoration Plan prioritizes the enhancement of habitat values for wildlife use including a potential future steelhead run and free passage of native fish within Dos Pueblos Creek.

2.2.1 Project Goals and Development Agreement

The provisions of the IDA included the following requirements:

1. Pay $100,000 to a non-profit conservation organization of Developer's choice "to initiate planning to enhance areas of natural, scenic, wildlife, biological, open space, and drainage corridors within Dos Pueblos Creek consistent with ongoing agricultural use on lands within the Dos Pueblos Creek drainage (Creek Restoration Plan).
2. The selected non-profit conservation organization "shall use its best faith efforts to complete a Creek Restoration Plan within one year after the Effective Date of this Agreement and the Developer shall offer all reasonable assistance to accomplish this outcome."
3. "Prior to commencement of grading or construction of the Inland Project, Developer will pay the sum of 300,000 dollars to a non-profit conservation organization of Developer's choice to be used to implement the Creek Restoration Plan."
4. "The non-profit conservation organization will use its best faith efforts to fully implement the Creek Restoration Plan within three years of after the Effective Date of this Agreement, and the Developer will offer all reasonable assistance to accomplish this outcome."
5. "Implementation of the Creek Restoration Plan will be subject to and will not occur until
    i. the approval and permitting of the Creek Restoration Plan by governmental agencies as required by law,
    ii. final approval and recordation of an Agricultural Conservation Easement from the California Department of Conservation with respect to the Inland Project Site,
    iii. withdrawal of the Notice of Violation issued by the California Department of Fish & Game and the claims asserted in that notice, and

iv. consent of Dos Pueblos Ranch with respect to the activities that occur on Dos Pueblos Ranch."

6. "Developer will condition the payment of the foregoing sums to the non-profit organization to require the non-profit organization to: (i) expend the funds for creek restoration elsewhere on the Gaviota Coast in the event that the Creek Restoration Plan is not implemented within five (5) years of the Effective Date for any reason, (ii) obtain the County's written consent as to the alternative creek restoration project prior to expending said funds, and (iii) complete the alternative creek restoration project with seven (7) years of the Effective Date."

2.2.2 Project Objectives and Restoration Opportunities

In order to meet the Project goals and objectives of this Restoration Plan, various modifications to previous creek disturbances are proposed to help reestablish more natural creek conditions. These restoration objectives are briefly described below.

- The Project proposes to bifurcate a portion of the creek channel in the upper reaches (i.e., referred to herein as the diversion structure location) to create a secondary, realigned earthen flow channel. At the existing concrete diversion structure location, which provides creek flow to the weir structure, the goal is to restore channel morphology with improved creek flow hydrology through the reestablishment and restoration of a secondary flow channel, in order to provide better flow connectivity, a more negotiable creek gradient for fish passage, remove existing creek berming and barriers, and restore appropriate native riparian vegetation within the restored channel.
- At four locations along the creek reach, old "Arizona" road crossings, that support vehicular access to ongoing agricultural activities, will be modified as part of the creek restoration effort. Two unpaved "Arizona" crossings, one paved "Arizona" crossing and grade control structure, and one "Arizona" crossing with a culvert drain will be replaced with free span bridges, or earthen bottom above-grade culvert crossings, in order to help restore the natural creek bed conditions and to allow for better fish passage. Restoration of disturbed areas surrounding these crossings will be revegetated with appropriate native species. In addition, non-native exotic vegetation that has invaded areas adjacent to these locations will also be removed and enhanced with native species.
- An old agricultural drainage structure and road crossing at a secondary tributary drainage to Dos Pueblos Creek will be modified to provide a water quality bio-retention basin to capture and treat agricultural runoff before it discharges into the main creek drainage. Removal of non-native species and revegetation with appropriate native species adjacent to this area will also be implemented in this location.

- Modifications to the creek channel are proposed under the Hwy. 101 bridge structure where old concrete paving and a vertical drop structure, poses a five foot vertical barrier to fish passage. The modifications in this area will need to be coordinated with Caltrans, as the work would occur within the Caltrans road right-of-way/easement area. The proposed changes include the establishment of new transitional pools with smaller drop structures downstream of the current drop structure, in order to eliminate the vertical barrier to fish passage and to provide resting pools for upstream fish passage.
- Downstream from the Hwy 101 bridge crossing, between the bridge and the ocean, portions of the creek channel that have historically been armored with concrete channel bank and bed protection will be modified where feasible. Where creek bed improvement is desirable and where previous creek bank disturbances warrant modification, alternative stabilization measures will be implemented and creek habitat restoration will be implemented. Modifications will be implemented where necessary in areas where the concrete creek bed surface is broken or has been undermined by flow, in order to improve the creek bed surface. In areas where creek bank stabilization is no longer needed, alternative stabilization measures will be implemented. All of these modifications are intended to improve the creek channel for fish passage, consistent with valid geomorphic relationships, including velocities, pool-riffle segmentation, and a suitable channel pattern including meander radii and amplitude suitable for bankfull flows and soil properties.
- The Project also proposes to restore the natural creek habitat conditions through restoration of disturbed areas, removal of non-native invasive exotic species and restoration of disturbed creek bank areas with appropriate native riparian species. The majority of the existing creek channel and its associated riparian vegetation will be preserved in place and will be protected in perpetuity. Areas resulting from grading of the restored creek areas and modifications to the existing creek structures will be restored and revegetated with appropriate riparian species. Enhancement areas associated with modifications to the creek banks and removal of exotic/non-native species within the adjacent creek bank margins, will also be revegetated with appropriate native riparian and transitional upland species.
- To ensure that the proposed stream restoration efforts are implemented successfully to meet the project goals and objectives to improve creek habitat, the project also includes the removal of sediment accumulated in various creek bed locations to help improve drainage flow conveyance and help restore and improve creek bed habitat functions for benthic macroinvertebrates. The proposed project will include a one-time removal of sediment from key identified areas and removal/thinning of non-native vegetation to improve the hydrology[1]

[1] Improvement of hydrology could constitute 1) flow persistence in early summer months, 2) improve the articulation of pools and riffles, diversifying opportunities for native fish habitat or more diverse benthic invertebrates, 3) improve conditions to facilitate winter movement and sorting of sediment through the system for a self-adjusting and natural channel bed.

in the creek channel area, thereby helping to improve flow and restoring appropriate functions within the creek.

Impacts associated with the project are limited to the modification and/or removal of the previous built obstructions and modified grading required to reconfigure the creek where proposed and to restore natural geomorphic conditions where possible. A more detailed description of the restoration locations is provided below in the Section 2.3 Site Evaluations.

Implementation of the proposed Project will result in temporary impacts to waters of the U.S., including wetlands, subject to regulation by the U.S. Army Corps of Engineers (ACOE) pursuant to Section 404 of the federal Clean Water Act (CWA); the Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the federal CWA and the Porter-Cologne Water Quality Control Act; and the California Department of Fish and Wildlife (CDFW), pursuant to Section 1602 California Fish and Game Code, the U.S. Fish and wildlife Service (USFWS) and the California Coastal Commission (CCC), pursuant to the California Coastal Act (within areas of retained jurisdiction at the mouth of the creek). In addition, portions of the Project located in the Coastal Zone are subject to coastal development permit requirements as implemented by the County of Santa Barbara pursuant to its certified Local Coastal Plan, which are appealable to the CCC. Because the overall intent of the Project is to improve the aquatic resource functions and services of the creek, no compensatory mitigation is proposed or required for these impacts, as the project is self-mitigating, as there will be an overall net improvement of creek habitat through the proposed restoration program. The extent of restoration-related activities and details regarding the Restoration Plan are outlined further in this report.

2.3 Potential Creek Restoration Site Evaluations

The Project addresses disturbed portions of the creek, starting at the Pacific Ocean and progressing inland approximately 3.4 miles to a stream diversion and weir structure (Figure 4). An approximate 0.6 mile section of the creek lies south, or downstream, of the Caltrans Hwy. 101 bridge crossing and the remaining 2.8-mile section of the creek lies north, or upstream, of Hwy. 101. The total Project area described in this Restoration Plan will address the entire 3.4-mile reach.

The property lies in the U.S. Geological Survey (USGS) 7.5 minute topographic map, Dos Pueblos Canyon Quadrangle (Figure 2). The property is mostly undeveloped farmland, with the exception of residential and agricultural development in the southerly portion. The project site is primarily characterized by moderately sloping terrain with naturally eroded creek banks. In the upper portions of the watershed creek bottoms are composed of bedrock, boulders, cobble and gravel, along with accumulated fine sediments. In the lower portions of the watershed there are some sections of natural creek bottom with cobbles and gravel, however there is also significant organic debris and

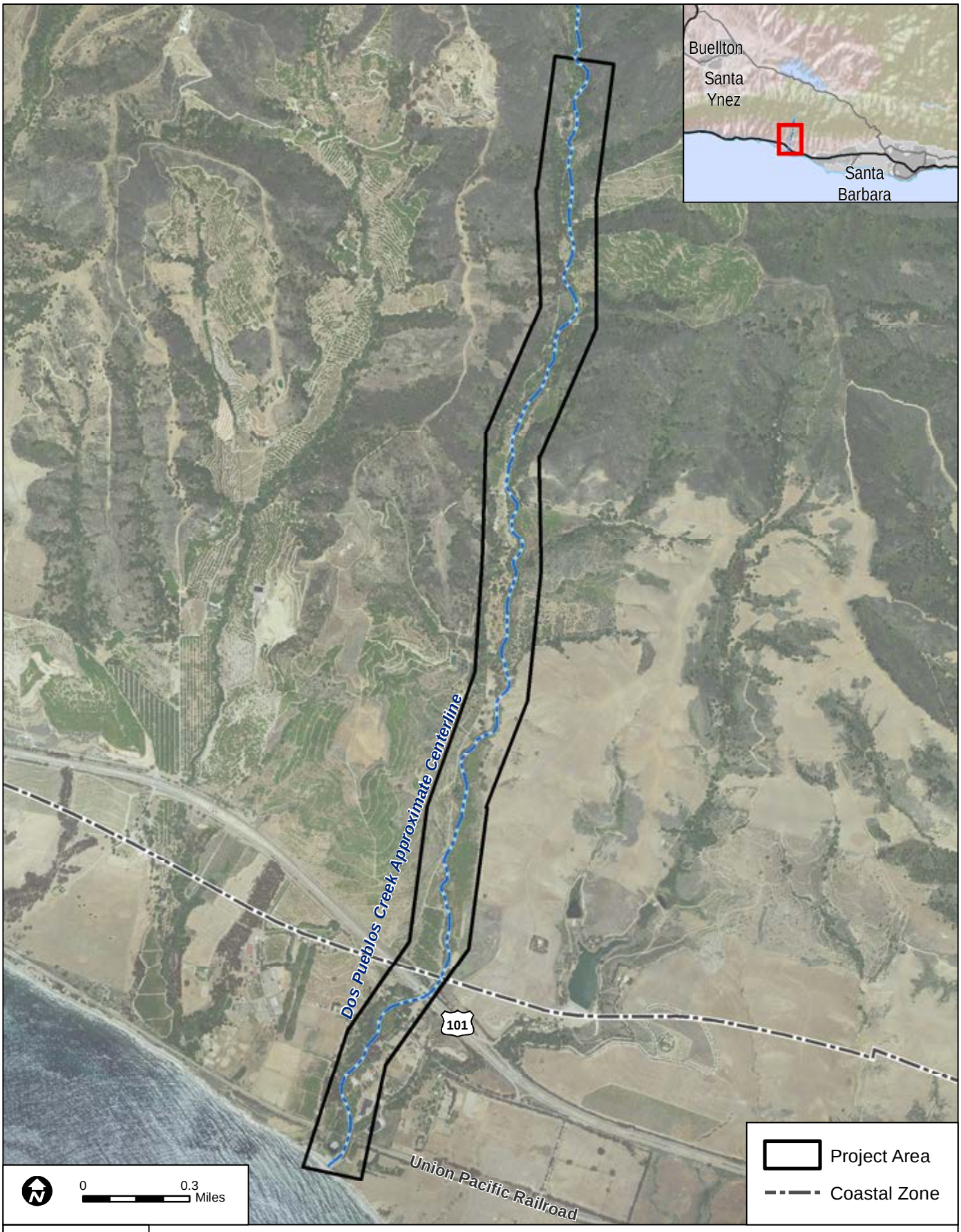
accumulated fine sediments. In portions of the creek south of Hwy. 101, concrete channel bed and bank lining is present, along with accumulated fine sediments. Natural, relatively mature riparian habitat exists along the majority of Dos Pueblos Creek, however the understory has been compromised in many locations due to the invasion on non-native ornamental and exotic species, precluding much of the native understory growth. The site is currently occupied by a combination of native riparian vegetation, disturbed habitat, and is interlaced with pockets of non-native invasive/exotic and ornamental vegetation.

The current Dos Pueblos Creek drainage flows within a fairly incised, north to south trending, perennial creek alignment, herein referred to as the creek drainage. This creek drainage was naturally configured from runoff from the north Dos Pueblos Creek watershed area, which originates in the southern flank of the Santa Ynez Mountains in the western portion of the Transverse Range. Secondary tributaries to Dos Pueblos Creek converge with the creek drainage at numerous locations, carrying additional flow, sediment, and solutes from natural hillsides and from agricultural fields surrounding the creek.

Elevations on site range from approximately sea level at the Pacific Ocean/beach outfall, to approximately 500 feet above mean seal level (AMSL) at the creek diversion/weir structure. The top of the watershed is at an elevation of approximately 3,200 feet msl.

Surrounding land uses include low density residential uses and farmland devoted to orchards of avocado, macadamia nut, Cherimoya and various citrus. A saltwater aquaculture plant is located in the southeast end of the project area, east of the creek. A saltwater intake and outfall location for the aquaculture plant is located in immediate proximity to the Dos Pueblos Creek ocean outfall. An old, but active, train trestle crosses the creek south of Hwy 101. Flow restriction under this structure is discussed in the restoration treatments.

The majority of the creek study area on the north side of Hwy. 101 lies within Assessor's Parcel Numbers (APN's) 079-080-034; 079-060-066; 079-060-065 and 079-040-005, within property currently owned by the Dos Pueblos Ranch Holdings, LLC. Two small portions of the creek north of Hwy. 101 fall within parcels 079-140-056 and 079-140-064 owned by the SBRHC, Inc. Creek areas south of the Caltrans Hwy. 101 bridge crossing lie in Assessor's Parcel Number (APN) 079-160-077; 079-080-027; and 0790-80-033 owned by the Schulte Land Trust. A small portion of the creek falls within parcels 079-160-015; 079-160-014; 079-160-075; 079-160-076, owned by Dos Pueblos Ranch Holdings, LLC.



SOURCE: NAIP 2014

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FIGURE 4

Aerial Overview Reference Map

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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The overall creek restoration area is surrounded by both existing native habitat and agricultural/farm uses. Proposed residential development envisioned by the Dos Pueblos Ranch and Santa Barbara Ranch projects would occur west and east of Dos Pueblos Creek. The restoration Project will occur along portions of the creek habitat areas mapped as riparian habitat, as well as within portions mapped as developed, ornamental, and portions of non-native vegetation. The details of the vegetation mapping are described in Section 2.4.6.

This Restoration Plan has been designed to restore creek aquatic resources and improve the overall creek habitat associated with the specific areas outlined below.

2.3.1 Restoration Area Descriptions: Areas South of Hwy 101 (Dos Pueblos Ranch Property)

Restoration Area A: Channelized Creek

At Restoration Area A, from the beach to the beach access road bridge, an approximate 1,000 linear foot (305 m) section of creek bed has been channelized into a concrete trapezoidal channel with a base width of 18 ft. to 30 ft. (5.5 m - 9.1 m), a vertical height of 6 ft. to 8 ft. (1.8 m – 2.4 m), and 1:1 (Horizontal (H):Vertical (V)) side slopes are typical There is a short constriction created by a rectangular concrete channel section [about 50 lineal feet (15.2 m), 20-feet (6 m) wide, and 7-feet (2.1 m) deep], where the creek passes between the footings of the railroad trestle where the bottom of the channel was lined with concrete.

Portions of the creek bed have degraded over time and portions of the channel bottom have become broken and/or eroded, resulting in the establishment of riparian vegetation rooting through the concrete into the channel bottom. Riparian vegetation is also rooted in sediment that has accumulated in portions of the channel, apparently underlain by concrete channel lining. Evidence of creek bank erosion is present in various locations and evidence of previous repairs and boulder placement for erosion control protection is present. Also, throughout the concrete channel, an approximately 4-foot (1.2 m) thick layer of accumulated sediment has deposited on one side of the channel leaving a low flow path about 9-feet (2.7 m) to 16-feet (4.9 m) wide on the opposite side. Trees and shrubs have established on top of the sediment and it is uncertain if the root systems have penetrated the concrete channel bottom. Bank erosion is also present at various locations and evidence of previous repairs and boulder placement for erosion control protection is present.

At the downstream end of the trapezoidal channel, there is a concrete apron that extends approximately 11.5 ft. (3.5 m) seaward, before ending abruptly on the upper portion of the sand and cobble beach. Depending on the time of year and the elevation of the sand along the upper beach, the seaward edge of the apron could be elevated as much as 1.6 ft. (0.5 m) above the beach surface. The

greatest disparity between the apron lip and beach elevation would likely occur during winter months when the amount of sand present on coastal beaches is typically at a minimum. During the March 2015 site visit, sand and cobble with some boulders had already accumulated along the beach, at the mouth of the channel, and on top of the concrete apron. As a result, the drop at the seaward lip of the apron was not present and water flowed directly from the channel onto the beach. Just east of the concrete channel mouth, there are two apparent saltwater discharge pipes that discharge water from the aquaculture facility to the beach. The discharged water appears to mix partially with creek outflow at the beach interface.

Perennial flow through the end of the creek channel was observed at the time of the site visit. In addition, a second drainage outfall from the Aquaculture pump facility appears to discharge directly into the concrete lined creek channel upstream of the beach outfall location.

The concrete lined trapezoidal channel runs from the beach upstream under the railroad trestle bridge to the beach access bridge location designated as Restoration Area B. Native riparian vegetation and non-native/ornamental vegetation occurs along this portion of the channel; primarily along the banks of the channel, but also at some locations within the channel bottom itself. Non-native ornamental vegetation appears to have originated from past landscaping of the area and the result of non-native invasive species passively colonizing portions of the creek channel and banks.

Restoration Area B: Beach Access Road Bridge and Channelized Creek

Restoration Area B starts at the wooden and metal bridge structure crosses the creek approximately 1,000 ft. (305 m) north of the ocean to permit vehicular access to the beach recreational area. Concrete channel lining on the creek banks and channel bottom are visible upstream of the bridge, but is quickly obscured due to dense vegetation cover. The trapezoidal concrete channel appears to terminate just upstream of the bridge location, likely about 20 to 30 feet (6 m – 9 m) upstream of the bridge. Native riparian vegetation exists on both sides of this creek crossing, however, a grove of non-native eucalyptus trees occurs to the northwest of the bridge.

Restoration Area C: La Casa Grande Bridge Crossing and Degraded Creek Bottom

At Restoration Area C, the La Casa Grande bridge crossing facilitates vehicular access to the westerly portion of the Dos Pueblos Ranch area. The bridge crosses over a fairly natural portion of the creek that has boulders and cobble and accumulated sediment in the creek bed. A somewhat isolated remnant pool exists under the bridge, likely the result of undercutting and erosion. One small rainbow trout was observed in this pool at the time of the site visit, but appeared to be small and in a somewhat emaciated condition likely due to being trapped in this location with little available food due to the degraded creek conditions and lack of benthic macroinvertebrates within the creek as a

food source. Concrete channel creek bank protection is present upstream from the bridge approximately 20 ft. – 30 ft. (6 m – 9 m) in length. Conditions downstream from this bridge are densely vegetated with riparian and wetland species in the overstory and a mixture of native and non-native shrubs and ground cover in the understory. Significant organic debris has accumulated within the creek channel. Numerous non-native ornamental tree species, including eucalyptus trees, are scattered along this section of the creek channel.

Restoration Area D: Hwy 101 Bridge and Concrete Drop Structure (Caltrans)

At Restoration Area D, the Hwy 101 bridge spans over the creek with both westbound and eastbound bridge sections. The bridge columns are located along the edges of creek banks, outside of the active flow areas. Gabion wire basket bank stabilization structures are present along the creek banks between the bridge columns and the creek flow area. A portion of old concrete paving is remnant within the creek channel, under the eastbound bridge (i.e., southerly bridge crossing), which allows for surface flow, as well as acting as a grade control drop structure. Dos Pueblos Creek flows over the flat surface of the concrete and then drops over the concrete lip to a plunge pool below. It appears from the age of this concrete structure and from its construction placed on top of stacked boulders, that the structure is very old and evidence suggests that it may be the remnant of an old road crossing through the creek. No concrete paving is present under the westbound bridge crossing. There is not apparent visible flow under the concrete, although seepage is likely occurring. This concrete paving currently serves as a drop structure to the creek, with an eroded grove helping to direct flow and an approximate 5 ft. (1.5 m) vertical drop along the south edge to the plunge pool below. Several pools occur further downstream from this location, with boulders and cobble present in the creek bed. The channel side slope creek banks are stabilized in this area by previously placed boulders, rip/rap and concrete rubble. The concrete grade control channel in this location is approximately 35-feet (10.6 m) long, 27-feet to 31-feet (8.2 - 9.5 m) wide, with side slopes about 1:1 and vertical confinement ranging from15-feet to 25-feet (4.5 – 7.6 m) in height. The five foot vertical drop currently poses a significant barrier to upstream fish passage. On both sides of the creek, at the grade control structure location, paved access roads located above the creek banks pass under Hwy 101 to connect to the ranches and the highway onramps on either side of the creek.

2.3.2 Restoration Area Descriptions: Areas North of Hwy 101 (Schulte Property)

Restoration Area E: Agricultural Drain Structure

At Restoration Area E, approximately 2,200 ft. (671 m) upstream from the Hwy. 101 bridge crossing, an existing concrete agricultural drainage structure is located under Dos Pueblos Canyon access road that carries intermittent drainage runoff from the westerly portion of the site, and adjacent agricultural fields, under the road, and allows drainage runoff to join Dos Pueblos Creek.

The road crossing appears to be a concrete culvert. There was no flow through this channel at the time of this site visit. Riparian vegetation does exist both upstream and downstream of this crossing. It appears that this location could intermittently carry agricultural runoff from the orchards to the west and north of this location. The Dos Pueblos Creek channel downstream from this location appeared to be in a fairly natural condition and supports sycamore and oak riparian forest areas.

Restoration Area F: Unpaved Low Water Crossing and Degraded Creek Bottom

At Restoration Area F, an unpaved low water earthen crossing of the channel exists, that facilitates access to avocado grove areas to the east of the creek. The creek channel is primarily cobble in this location. No water was present at the time of the site visit. The crossing was at grade and did not present a significant drop along the channel.

Restoration Area G: Unpaved Low Water Crossing and State Water Crossing

At Restoration Area G, an unpaved low water earthen crossing of the channel exists, that facilitates access to agricultural areas to the east of the creek. The creek channel is also primarily cobble in this location. A small amount of ponded water in the channel bottom was present at the time of the site visit. A water line crosses the creek in this location on the north side of the road crossing. A large pipe terminus also protrudes from the middle of the stream bed, presumably connected to the Central Coast Water Authority (CCWA), Goleta west conduit. A Pacific Chorus frog was observed at this location.

Restoration Area H: Paved Low Water Crossing and Concrete Drop Structure

At Restoration Area H, a concrete paved low water crossing of the channel and grade control structure exists that facilitates access to agricultural areas to the east of the creek. The creek channel at the crossing is primarily concrete lined, with concrete headwalls downstream that form a 4-foot (1.2 m) vertical drop grade control (measured from the crossing centerline to the top of sediment downstream. Creek bank protection walls also exist on both sides of the creek for approximately 50 feet (15.2 m) downstream from the drop structure location. Sand and pebbles have accumulated just downstream of the drop structure, followed by cobbles and boulders further downstream. The upstream channel meets the grade of the road and is also composed of boulders and cobbles. No water was present in the channel at the time of the site visit. A large apparent agricultural water line is suspended overhead, presumably above peak flood levels.

Restoration Area I: Dual Drain Culvert Creek Crossing

At Restoration Area I, an earthen access road crosses the creek above grade, with dual 30-inch (0.76 m) corrugated ABS black plastic culvert drain pipes which have been placed to convey flow, each approximately 40 ft. (12.2 m) in length. The pipes are backfilled with sloping earthen embankments

on either side of the road crossing. This crossing appears to have been recently re-constructed and is reported to have washed- out previously on numerous occasions. This crossing may be the source of some of the sediment observed in the creek channel downstream from this location. Some non-native invasive caster bean plants were observed immediately to the south of the road crossing on the creek bank and within the creek channel. The presence of the plastic corrugated drain pipes, with a lack of a natural creek bottom in this location, poses a potential barrier to upstream fish passage. Also, it appears the pipes are installed too close together, precluding proper backfill between them, with evidence of erosion occurring between the two pipe culverts.

Restoration Area J: Abandoned Flood Gate Structure

At Restoration Area J, an old abandoned concrete flood gate dam structure exists, which appears to have been used to retain flow behind this dam/barrier structure and may have had a flood gate that could have been manipulated to control flow. The old gate has been removed and a curved eroded opening in the wall, about 2-feet (0.6 m) high and 3-feet (0.9 m) wide, now serves as a weir to the creek flow, with a plunge pool below and another pool above the structure. There is an approximate 1.5 ft. (0.46 m) vertical drop at this location. This structure may have also been used as a creek diversion structure for agricultural use. There was a trickle flow over the weir at the time of this visit. The presence of this vertical drop could pose a barrier to fish passage. Upstream of the flood gate structure, boulders have accumulated and aggregation was observed in the creek bed. Downstream of the flood gate structure a plunge pool has formed and the channel appears to have formed a flood bypass channel on the right bank downstream from this location. The creek was not flowing downstream of this point, but some water was ponded in the bed of the channel.

Restoration Area K: Unpaved Low Water Crossing

At Restoration Area K, an unpaved low water earthen crossing of the channel exists, that facilitates access to avocado grove and agricultural areas to the east and north of the creek. This also facilitates access to agricultural pumps and tanks on the east side of the creek. The creek channel is primarily earthen in this location. A small amount of water was ponded in the crossing at the time of the site visit. This crossing may be causing some downstream sedimentation due to its earthen condition. Several non-native eucalyptus trees are present surrounding this location. This location is just upstream from an abandoned water feature which appears to have been used for past recreational purposes and has a pile of boulders in the center of the old feature that may have been used for an island. This old water feature lies to the west of the main creek channel, is separated vertically from the creek and does not appear to have any direct natural flow from the creek. Water may have been pumped to this location previously.

Restoration Area L: Agricultural Water Diversion/Weir Structure

At Restoration Area L, a man-made concrete rectangular channel about 15.5-feet (4.7 m) wide and 3-feet (0.9 m) deep exists, which deflects water flow from the main creek channel, at a natural turn in the creek, diverting the creek flow to the east and around a curve in the canyon to a weir diversion structure, which forms a nearly vertical drop of about 16-feet (4.9 m) in the creek. Flow is diverted at the weir in a covered diversion box structure through two iron water lines that carry water via gravity flow to various locations downstream for agricultural use. An old agricultural pond and a sediment filtration facility are located on the downstream end of the pipe, located approximately 500 ft. (152 m) to the west of the main creek channel, with an elevation difference from the creek of approximately 40 ft. (12.2 m) in height. This weir diversion structure has been in place for many decades and has been subject to water use agreements between various parties. A concrete lined spillway, drop structure, and large pool in bedrock are present at this location. Significant concrete lining of the creek bed and banks are also in place downstream of this location to protect the creek channel from erosion during high storm flows. The concrete lined channel upstream of the weir is eroded and broken in several locations. Water flow was present at the time of the visit and water was entering the diversion pipes, however, very little water was going over the spillway. The elevation change from this weir location to the natural creek channel bottom downstream is approximately 16 feet (4.9 m) from the lip of the weir to the tail-out of the pool below. A coarse survey of the creek profile was conducted during the site visit on March 11, 2015 by Balance Hydrologics and is provided in Appendix B.

At the start of the concrete channel, at the upstream end, it appears that the natural creek channel may have been previously blocked-off with earthen berms and boulders to help divert flow into the concrete channel. Natural recruitment of native species has occurred in this location over time making it difficult to ascertain the exact area of prior disturbance however, some topographic mounding is apparent. Evidence of erosion along the west creek bank at the diversion location, breakage in the concrete wall, and deposition of some boulders and cobble suggests that creek flow sometimes overtops the concrete wall and flows in a secondary natural channel that borders the concrete channel on the right bank, however the flow is still retained by the earthen berms. Topography within this canyon area suggests that an old natural creek channel still exists to the west of this location, which joins with the natural creek at the pools below the weir structure. The access road to the weir structure apparently crosses the old remnant natural creek channel. There appears to be potential in this location, through reconfiguration of the road, removal of the earthen berms and boulders, and re-grading of the old channel, to re-establish a secondary creek flow to the former natural creek channel. This could allow for a series of step pools to be re-established that might help facilitate fish passage to the more natural northerly sections of the creek upstream from this location. In its current physical condition, the vertical drop at the weir structure poses a physical barrier to fish

passage past this location. It should be noted that California Newts (salamanders) were observed within the concrete lined channel area above the weir structure, however benthic macroinvertebrate presence was minimal.

2.4 Existing Conditions

2.4.1 Site Topography, Elevations and Soil Types

The project area is located on the southern flank of the Santa Ynez Mountains, in the western portion of the Transverse Ranges Geomorphic and Structural Province. The area is characterized by east to west trending faults, folds, mountain ranges and valleys (Minor, et al 2009). Dos Pueblos Creek occurs within Dos Pueblos Creek Canyon, which is within the Dos Pueblos Creek Watershed Area. Elevations on site range from sea level, at the beach creek outfall location, to approximately 1,320 feet (402 m) above mean sea level (MSL), at the upper northern boundary of the drainage. Slope gradients range from 1-3% on the mountain terraces to nearly vertical along the steep canyon ravines. The steeper areas are subject to erosion and slope failure/instability.

The soils in the area are relatively high in clay content and are expansive and unstable (USDA-NRCS 2011).

2.4.2 Site Hydrology

Runoff within the Dos Pueblos Creek Watershed area is from the southern flank of the Santa Ynez Mountains. The creek produces seasonal runoff, as well as water input from two horizontal wells that were developed decades ago to help provide flow for agricultural purposes and past domestic water use. The wells can be utilized in the summer months and closed in the winter months when not needed for irrigation. A portion of the creek flow in the upper watershed is diverted at a concrete diversion channel and weir structure about 3.4 miles (5,472 m) from the mouth of the creek, at approximate elevation 500-feet (152 m). This water use is based upon complex previously negotiated water rights and water use agreements. Water is partially diverted through the gravity pipelines at the weir location for agricultural use and in part to a storage lake at lower elevations within an adjacent watershed.

Further down the watershed three alluvial wells were previously used to help supplement the agricultural water supply, however they currently are not operating, but could be used in the future seasonally for agricultural purposes. Additional deeper wells are also used at the bottom of the watershed. These wells are utilized in conjunction with water supplied by the CCWA pipeline. According to Hoover (2014), flow in Dos Pueblos Creek above the diversion structure ranges from 0 to 8,367 acre-feet (AF)/month in winter and spring months (Oct-Apr) and 0 to 1,022 AF/month in the summer months (May-Sep), trending to about 1 AF/month in the driest part of the summer in the

last 3 years. These data are based on watershed based calculations of rainfall-runoff calculations by Hoover (2014). A flow gage has also been established at the weir and has historically been monitored to develop a hydrograph for the creek. Flow looks to be perennial above the weir. It was noted during the field work in March 2015, although not directly observed, that a pronounced inflow or waterfall was heard upstream of the concrete diversion channel, indicating more flow upstream.

Also, according to Hoover (2007), there is a State License #4578 for diversion of 1.75 cubic feet per second (cfs) from April 1 to November 1 of each year. This flow is diverted and routed through the pipelines, to the sediment basin and then on to agricultural use and storage in the lake at lower elevations within the watershed. From October 31 to May 1 the maximum allowed diversion is 2.0 cfs. The language from the state license is worded as follows: "State License #4578 for diversion of amounts beneficially used for domestic, irrigation and stockwatering uses, not to exceed: (A) one and seventy-five hundredths (1.75) cubic feet per second by direct diversion to be diverted from Dos Pueblos Creek as follows: (a) from April 1 through November 1 of each year for irrigation and (b) through the year as required for domestic and stockwatering purposes, and (B) three hundred and eighty nine (389) acre-feet per annum by storage to be collected from about October 31 of each year to about May 1 of the succeeding year." The agricultural use is estimated to vary from 480 to 960 AF per year, based on 1.6 AF per acre of orchard for 300 to 600 acres. The watershed is estimated to produce from 79 to 14,234 AF per year, with a production of 157 to 302 in the last three dry water years. Augmentation from the horizontal wells is about 69 to 214 AF per year. Current residential water use appears to be provided by CCWA deliveries, leaving the diverted Dos Pueblos water strictly dedicated to agricultural use, with subsequent return flows to the creek.

Within the watershed the stream bed goes dry in some reaches during the spring and summer, as was observed during the site visits on March 10 and 11, 2015. This is likely due to the episodic nature of stream flow in these types of systems, the presence of porous alluvial and colluvial deposits, and, more recently, the fourth year of severe drought conditions.

During the site visit three flow measurements were made as follows:

- Flow upstream of the weir, at the upstream end of the concrete diversion channel = 0.37 cfs on March 11, 2015 at 13:30
- Flow on Dos Pueblos Creek, just downstream of the La Casa Grande Road bridge = 0.14 cfs on March 10, 2015 at 16:30
- Flow at the Highway 101 grade control structure = 0.05 cfs on March 11, 2015 at 16:30, from bucket measurement, not including leakage through grade control, believed to be an underestimate of actual stream flow.

2.4.3 Site Geomorphology

Geology

The Dos Pueblos Creek watershed traverses depositional rock units, three major faults, landslide areas, and a marine terrace. A geologic map and legend from Brant (2007) are provided in the Appendix B. The upper watershed consists of interbedded sandstone, mudstone, and siltstone. At the stream level, an alluvial and colluvial deposit has formed, composed of weathered and rounded material about 10 m thick or less. This geologic unit continues to the mouth of the creek at the ocean. As the creek runs downhill it is bounded by a large landslide to the East and Vaqueros Sandstone to the West. The stream exits the canyon through confined terrain as it flows through the Rincon Shale, entering an expanse of upper Pleistocene Marine terrace deposits, just prior to meeting the ocean.

Geomorphology

An estimated profile of the stream was generated from the mouth of Dos Pueblos Creek to a point just upstream of the diversion weir (see Appendix B). These data are based on a query on the USGS StreamStats Server, which generates profiles from USGS DEM data with a coarse 90-foot (27.4 m) grid. The profile data approximates stream slope which follows the valley slope, as represented by the DEM data. By inspection, the project reach was broken into three reaches as follows:

Reach 1- Mouth of Dos Pueblos Creek to Hwy 101

Reach 1A: About 2000-feet of a trapezoidal concrete channel with a degraded bottom, sloping at about 1.5 to 2.0%. The channel dimensions vary from 18 to 30 foot base width. Within the channel, aggradation of fine material has occurred on one side of the channel to a level of about 4 feet, leaving a low flow path on the other side of about 10 feet on average. Vegetation has established on top of the aggraded material, but none apparently older than 5 to 10 years. Presumably, major storm events clear out the aggraded fine material and the vegetation it hosts, leading to another cycle of deposition and washout. The channel bottom is predominantly concrete, although the extent of the intact concrete bottom is unclear.

Reach 1B: Upstream the Casa Grande Road bridge location, the channel returns to a natural bed and bank condition. It also slopes about 1.5 to 2.0% until it meets the grade control structure at Highway 101. During field reconnaissance, the bankfull width was estimated at about 20-feet and bankfull depth was estimated from 2.0 to 3.0 feet. These field measurements are slightly different from regional regressions by Dunne and Leopold (1978) which are based on San Francisco Bay Area data, indicating a bankfull width of 25- to 30-feet and bankfull depth of about 2.5-feet. Recent regional curve data developed by Modrick (2014) for southern California streams indicate more comparable bankfull dimensions, with a bankfull width of about 15- to 18-feet and bankfull depth from 1.0- to 1.3-feet deep.

The bed material was typical cobbles boulders, with less gravel and some fines. No knick points were observed in the reach. Coarsening of the bed material occurred in the upstream direction.

Reach 2 – Highway 101 to Weir and Diversion

Reach 2A: Pool and riffle reach with some step pools. This reach slops from about 1.5 to 3.0%. It represents a depositional zone of the larger material and forms into riffles and pools, with occasional step pools. The upper end of the reach is located about where the geologic unit transitions from alluvial and colluvial to bedrock formed by the interbedded sandstone and mudstone.

Reach 2B: Step pool reach with boulders on bedrock. Within this reach the slope is from 4 to 7%, as driven by a hard layer of bedrock as the creek emerges from the upper canyons. It is more likely this reach will present surface flow, as the flows will perched on the bedrock, as opposed to Reach 2A where flow will more likely go underground into the colluvial deposits.

Reach 3 – Weir and Diversion to confluence with East branch upstream

Reach 3A: Concrete diversion channel. About 300-feet upstream of the weir, there is a 15-foot (4.6 m) wide and 3-foot (0.9 m) deep concrete diversion channel which directs flow to the weir. The estimated slope is from 2 to 4%. Throughout the reach the concrete bottom is degraded and punctured in numerous locations, leaving potholes in the center of the channel. At the upstream end the right bank concrete wall is chipped down and broken, which either naturally occurred, or may have been purposefully done to provide a secondary flow path to the abandoned natural channel and a secondary channel that runs adjacent to the concrete channel.

Reach 3B: Natural step pool and bedrock channel. Upstream of the diversion channel the stream returns to a well naturalized and organized progression of step pools with an estimated slope of about 5 to 10%, or 8% on average. Bankfull width appeared to be about 15 to 20 feet (4.6 - 6.1 m) and bankfull depth appeared to be about 2 to 3 feet (0.6 – 0.9 m).

2.4.4 Aquatic Habitat Conditions

Since we were unable to observe the entire stream corridor during the March 10 and 11, 2015 site visit, the following descriptions of the stream habitat are based on information provided in the Dos Pueblos Creek Conceptual Habitat Restoration and Monitoring Plan (Impact Sciences 2010) and from observations of selected stream reaches associated with potential restoration areas identified in the Impact Sciences plan.

Methods

The approximately 3.4-mile (5,472 m) stream length within the project area was divided into two reaches for aquatic evaluation purposes. Reach 1 was based primarily on the location of the first substantial barrier on the creek to upstream movement of fish, which includes the location of the extensive concrete channelized section of the lower portion of the creek, and stream gradient. As a result, Reach 1 included the mouth of the creek upstream up to the grade control structure located directly beneath the Highway 101 Bridge; and Reach 2 included the creek from above the grade control structure upstream to the vicinity of the creek diversion and weir structure.

During the site assessment conducted in Reach 1 on March 10, Denis Ruttenberg and Craig Seltenrich walked the majority of the concrete channel from the mouth of the creek at the beach outfall location upstream to the La Casa Grande bridge, and spot checked a few locations between the La Casa Grande bridge and the Highway 101 bridge creek crossing. Due to the number of identified restoration sites upstream of the Highway 101 Bridge and time constraints, the site assessment for Reach 2 (conducted on March 11) consisted primarily of visual observations of stream characteristics within and adjacent to the areas identified by Impact Sciences (2010) as potential restoration sites. Consequently, the accuracy of stream habitat information collected in Reach 1 was sufficient to generally describe stream habitat characteristics throughout the reach. However, since stream habitat information on Reach 2 was obtained primarily at and/or adjacent to potential restoration sites, and did not include the entire creek corridor, there was insufficient information to describe the overall condition of stream habitat within the entire reach.

Habitat typing was conducted according to procedures outlined in the California Salmonid Stream Habitat Restoration Manual, Fourth Edition (Flosi, et al 2010) at several locations within the two reaches at a flow volumes ranging from 0.14 to 0.37 cubic feet per second (cfs); as a result, stream habitat data collected during the site assessments are only applicable for stream flows in this general range. As outflows increase, habitat types are continually recreated, reflecting primarily changes in flow volume on channel morphology and stream gradient. Stream habitat typing at each location was conducted starting at the downstream end of the reach and proceeding upstream. Habitat data was collected at three general locations within the two reaches; immediately downstream of the La Casa Grande bridge near the upper end of the concrete channel, and in the vicinity of the two major drop structures; upstream and downstream of the grade control structure beneath the Highway 101 bridge, and upstream and downstream of the weir structure and associated concrete channel upstream. Both of the drop structures are situated at locations where significant gradient breaks occur within the overall project reach. The locations in Reach 1 were immediately downstream of the La Casa Grande bridge near the upper end of the concrete channel, and immediately downstream of the grade control structure beneath Highway 101. The locations in Reach 2 include immediately upstream of the grade control structure beneath Highway 101, and immediately downstream of the spillway and upstream of the

concrete channel at the weir. Due to time constraints, habitat typing was restricted to relatively short sections of the creek, approximately 98 – 262 ft. (30 to 80 m) lengths.

Basic water quality data was also collected in several locations within both reaches using a Horiba Model U-53-2, multi probe analyzer. Data collected at each location included temperature (°Centigrade), dissolved oxygen (DO, mg/L and % saturation), pH, conductivity (ms/cm), total dissolved solids (TDS, g/L), Nephelometric Turbidity Units (NTU, mNTU), and oxygen reduction potential (ORP, ORPmV).

Results

Reach 1 (Mouth of Dos Pueblos Creek upstream to the Highway 101 Bridge)

Reach 1 includes the lower concrete channelized portion of the creek, from the mouth of the creek at the beach outfall location, upstream to just above the La Casa Grande bridge crossing; and the natural stream bed portion of the creek from the upstream end of the concrete channel, upstream to just below the drop at the grade control structure beneath the Highway 101 bridge creek crossing. Habitat typing was conducted at two locations within Reach 1: an 262 ft. (80 m) reach immediately downstream of the La Casa Grande Bridge, and a 102 ft. (31 m) reach immediately downstream of the Highway 101grade control structure (Appendix B, Tables B-1 and B-2).

Description of Reach

Lower Reach (concrete channel section)

The reach from the mouth of Dos Pueblos Creek, upstream to just downstream of the La Casa Grande bridge, is low-gradient (0-2%) and can be characterized as primarily a depositional zone. The lower portion of the reach consists of a trapezoidal concrete channel that extends from the mouth of the creek at the beach outfall upstream approximately 2000 ft. (610 m), to about 20 ft. (6 m) upstream of the La Casa Grande Bridge. The channel has a bottom width of about 20 ft. (6.1 m) with slanted walls approximately 7 ft. (2.1 m) in height. The channel is in various stages of disrepair, including sections with broken concrete and areas where vegetation appears to be growing through cracks and broken concrete in the channel bottom, but still appears to confine flows within the channel banks. In most of the upper portion of the reach, the margins of the channel are overgrown with vegetation and the slanting concrete walls are only visible through small breaks in the dense vegetation. Canopy cover throughout much of this lower reach ranged from about 40 to 100%, with an average of about 60 to 70%.

The majority of the length of the concrete channel has been filled with sediment to a greater or lesser degree, and much of the concrete channel bottom is no longer visible. In some areas, as much as 3 –

5 ft. (1.0 - 1.5 m) of fine sediment, along with cobbles and boulders in some locations, has accumulated on one side of the channel or the other, depending on the aspect of the upstream channel. A great deal of this sediment appears to have been deposited over a long period of time, since relatively large trees were growing out of the sediment mounds in numerous locations. Due to the substantial amount of sediment present, most of the channel contains abundant well-established and seasonal vegetation, which functions to anchor the sediment in place, and limits the potential flushing capability of high winter flows. It is highly doubtful that even substantial outflows would dislodge and move much of the sediment or vegetation downstream and out of the system.

At the downstream end of the trapezoidal channel, there is a concrete apron that extends about 11.5 ft. (3.5 m) seaward before ending abruptly on the upper portion of the sand and cobble beach. Depending on the time of year and the elevation of the sand along the upper part of the beach, the seaward edge of the apron could be elevated as much as 1.6 ft. (0.5 m) above the beach surface. The greatest discrepancy in elevation between the apron lip and the beach would likely occur during the winter when the amount of sand present on coastal beaches is typically at a minimum. At the time of the site visit, sand, gravel, and cobble with some boulders had already accumulated along the beach, at the mouth of the channel, and on top of the concrete channel and apron. As a result, the drop at the seaward lip of the apron was not present and water flowed directly from the channel onto the beach. Just east of the concrete channel mouth, there are two discharge pipes that convey seawater from the aquaculture facility, located about 984 ft. (300 m) north-northeast of the mouth of the creek along the east side of the channel, to the top of the beach. The discharged water appears to mix partially with creek outflow at the beach interface.

Upper Reach (natural channel section)

In the upper portion of the reach, from the upstream end of the concrete channel located just above the La Casa Grande bridge upstream to the Highway 101 bridge [approximately 1066 ft. (325 m) in length], the stream channel gradient increases (2-8%) and has a natural bed and bank consisting primarily of boulders and cobble with some gravel and very little vegetation within and immediately adjacent to the creek bed. Canopy cover was relatively dense in this upper section, with an estimated range of about 60 to 100%, and average canopy cover of around 80%. Stream habitats appeared to consist primarily of runs, step-runs, short riffles, and a few pools. Due to the abundance of fine sediment within Reach 1, pool depths were relatively shallow with the exception of the plunge pool immediately downstream of the grade control structure beneath the Highway 101 bridge crossing, which had a maximum depth of 3.6 ft. (1.1 m). Stream widths within this section varied with location, although the average width appeared to be around 9.8 ft. (3 m). In general, this section of the creek contains less sediment relative to the amount of sediment occurring within the downstream concrete channel, although fines (silts and clays primarily with very little sand) are still present in depressional areas and in areas with low gradient, but comprise a smaller percentage (5-10%) of the overall substrate composition in these areas.

Stream Habitat

Concrete Channel

Even though the concrete channel has substrate on top of most of the channel bottom, which creates pseudo stream habitats consisting mostly of runs and glides, the presence of excessive amounts of fine sediment creates extremely poor habitat for aquatic species. However, in the upper section of the concrete channel, downstream of the La Casa Grande bridge crossing, hard substrates consisting of boulders, cobble, and gravel are present with substantially less fine sediment, giving the impression of a more natural channel.

Stream habitat typing was conducted within an 262 ft. (80 m) section near the upper end of the channel, immediately below La Casa Grande bridge, at a flow volume of 0.14 cfs, resulting in primarily pool and run (step-run) habitat, with a few short low-gradient riffles. Fines comprised a little less than 10% of the overall substrate composition with the highest percentage of silt (20%) occurring in one long pool 105 ft. (32 m).

Throughout much of the lower portion of the reach [especially in the lower 1,312 ft. (400 m) of the channel], the sediment below the thin upper surface layer was black and highly anoxic precluding the presence of many soft bottom invertebrates. Other than water striders and a few aquatic invertebrates, very few aquatic insects were observed throughout most of the length of the concrete channel due primarily to the limited amount of hard substrate and the dominance of fine sediment. The abundance of riparian vegetation present along much of the channel likely provides a source of terrestrial insects to the stream, but the absence of suitable habitat for fish in this lower portion of the reach precludes the presence of southern steelhead (*Oncorhynchus mykiss*), and many other stream dwelling species.

No habitat for rainbow trout was present in the lower portion of the concrete channel, although very limited instream cover was present for fish (<5%), consisting primarily of overhanging vegetation and object cover, downstream of the La Casa Grande bridge. No rainbow trout were observed in the reach from the mouth upstream to the La Casa Grande bridge. One Pacific tree frog (*Hyla regilla*) was observed along the concrete channel downstream of the La Casa Grande bridge.

Natural Channel

Only a few limited observations were obtained upstream of the La Casa Grande bridge and the concrete channel. Stream habitats appeared to consist primarily of runs and step-runs with a few occasional shallow pools. Increased stream gradient and the presence of a natural stream bed containing boulders, cobble, and gravel with smaller amounts of sediment than in downstream areas

create improved stream conditions for aquatic species. Due to the apparently lower percentages of silt and clay within this section, very little vegetation was observed growing within the creek bed.

Stream habitat typing was conducted within a 102 ft. (31 m) section of the natural creek channel immediately downstream of the grade control structure beneath the Highway 101 bridge creek crossing, resulting in primarily run and pool (main channel plunge pool) habitat, with a few short low-gradient riffles. Boulder and cobble comprised 60 to 75% of the substrate with only a small percentage (5%) of fines.

Instream cover for fish appeared to be fairly low ranging from 0 to 10%, consisting primarily of overhanging vegetation and object cover. One rainbow trout was observed in a small pool immediately upstream of the bridge crossing, although the body condition (very slender) indicated that food resources were low. It is likely that the benthic macroinvertebrate (BMI) community within this section is more diverse than that observed in the lower part of the reach where fine sediments dominated the substrate; however, a cursory examination of cobbles and boulders above the bridge did not indicate the presence of a robust BMI community.

Water Quality

Water quality measurements were obtained at two locations within the reach: at the mouth of the creek at the beach outfall location, prior to the creek leaving the concrete channel, and just downstream of the La Casa Grande bridge (Appendix B, Table B-6). In general, water quality values for all parameters tested were within the range of expected values for coastal streams.

Even though the water discharged from the aquaculture facility appears to mix partially with creek outflow at the beach interface, it is doubtful that the volume of this discharge would significantly alter water chemistry within the creek (especially during high flow periods) and limit the ability of southern steelhead to locate this natal stream, if southern steelhead were re-established.

Reach 2 (Highway 101 Bridge upstream to creek diversion/weir structure area)

Reach 2 includes the natural channel immediately upstream of the Hwy 101 grade control structure, upstream to the creek diversion/weir structure and the associated concrete trapezoidal channel upstream of the weir, and the natural channel upstream of the end of the concrete channel for a distance of approximately 246 ft. (75 m). Habitat typing was conducted at three locations within Reach 2: a 144 ft. (44 m) reach immediately upstream of the grade control structure beneath the Highway 101 bidge, a 157 ft. (48 m) reach immediately downstream of the weir spillway, and a 164 ft. (50 m) reach immediately upstream of the weir and concrete channel (Appendix B, Tables B-3, B-4, and B-5).

Description of Reach

Reach 2 was generally assessed as having a higher gradient (range of 2-7%) with an average gradient of about 2-4% than Reach 1, although low-gradient areas were also present within this reach, especially in the lower half of the reach. Stream widths appeared to range from about 6.5 – 20 ft. (2 to 6 m) wide. Boulder and cobble were the dominant and subdominant substrates throughout much of the reach, although gravel was also common in some locations. In the upper portion of the reach (from about the location of the abandoned flood gate structure, upstream to the weir and above), the dominant substrates also included variable percentages of bedrock. Fine sediment (silt and clay) was often present in pockets behind boulders and bedrock, in protected areas along the stream banks, and in most of the pools with the exception of plunge pools. In some low gradient areas, rock surfaces were also covered with a layer of fine sediment. The creek was incised in some locations with nearly vertical banks [consisting primarily of earth and rocky substrates (boulder, cobble, and gravel) up to about 6.5 -10 ft. (2 -3 m) in height, in some places]. Other sections of the creek were only slightly incised with low to moderate bank gradient. Much of the lower portion of the reach (from the Hwy. 101 Bridge/grade control structure, upstream to the general vicinity of the paved agricultural road crossing and drop structure) has abundant streamside vegetation. In upstream areas, increased channel gradient and the presence of bedrock and large boulders results in substantially less streamside vegetation within this portion of the reach. Canopy cover varied throughout the reach, although the average canopy cover appeared to be in the range of 60 to 70%.

Stream Habitat

Immediately upstream of the grade control structure beneath Highway 101, low stream gradient (0-1%) and slow water velocities result in habitat dominated by long runs and step-runs, with relatively high amounts of sediment and vegetation within the channel. In locations where fine sediments were thick (10 cm+), the substrate was anoxic. Hard substrates are also present in this area, but were buried under thin to thick accumulations of fine sediment. Streamside vegetation was abundant upstream of the grade control structure, with variable canopy cover ranging from about 30 to 70% (averaging about 50%).

In general, stream habitats further upstream of the agricultural road crossing/ grade control structure were relatively similar to habitats observed in the natural channel between the La Casa Grande bridge and the grade control structure beneath the Highway 101 bridge.

Stream habitat typing was conducted within a 144 ft. (44 m) section immediately upstream of the agricultural road crossing grade control structure, consisting entirely of one long run. The dominant substrate appeared to be cobble with a few boulders; however, the presence of at least 20% fines, which covered all hard substrate, made it difficult to accurately evaluate substrate percentages.

Stream habitats in the vicinity of the proposed restoration sites (and based on geomorphology and stream gradient) consist primarily of runs, step-runs, and short riffles with occasional pools (mostly main channel pools). At the existing creek outflow 0.5 ft. (0.14 m) for the majority of the reach up to 0.37 cfs upstream of the weir), stream widths at the potential restoration sites identified within this reach by Impact Sciences (2010), appeared to vary from about 5 – 16 ft. (1.5 to 5 m), with an average width of around 11.4 ft. (3.5 m). Due to the abundance of fine sediments, pool depths were generally shallow. Substrates were generally dominated by boulders and cobble with smaller percentages of gravel. Very little sand was observed within the reach; however, fine sediment (silts and clay) was locally abundant in pools and pockets in slow water areas, especially in areas with low stream gradient (2%). Pockets of sediment were observed in the vicinity of most of the proposed restoration sites, as well as upstream of the weir. In several locations, main channel pools and depressions downstream of boulders and bedrock contained large amounts of sediment, and in some pools, up to 2 ft. (0.6 m) of sediment was recorded. In low gradient areas, a thin layer of fines often covered much of the rock substrate. The only observed pools that did not contain large amounts of sediment were plunge pools located immediately downstream of the various drop structures (e.g., immediately downstream of the grade control structure beneath Highway 101, downstream of the abandoned gate structure, downstream of the paved agricultural road crossing drop structure, and downstream of the grade control structure beneath Highway 101 bridge).

Stream habitat typing was conducted within a 157 ft. (48 m) section of the creek, immediately downstream of the weir spillway and in a 164 ft. (50 m) section immediately upstream of the concrete channel above the weir. The section downstream of the spillway consisted primarily of main channel pools and a step-run. The dominant substrates were cobble, boulder, and bedrock with lesser percentages of gravel. Fine sediment accounted for only about 5% of the substrate in the step-run and plunge pool; however, one of the main channel pools contained approximately 30% fines. The section upstream of the concrete channel above the weir consisted primarily of main channel pools, high-gradient riffles, and step-runs. The dominant substrates consisted of boulder and cobble with relatively small amounts of gravel. Fine sediment ranged from 5% in the riffles to 65% in the main channel pools.

No rainbow trout or any other fish were observed in the vicinity of any of the proposed restoration sites in Reach 1. Instream cover for fish was generally low ranging from 5 to 20% with an average of about 10%, consisting primarily of object cover and some undercut banks. Very little large woody debris or complex cover was observed during the site assessment. With the exception of the large main channel plunge pools at the downstream ends of the drop structures, all of the main channel pools observed during the site assessment were partially to nearly full of fine sediment. The lack of large woody debris and pools with sufficient depth to provide cover, and the presence of relatively high percentages of fine sediments throughout the reach, creates relatively poor habitat for rainbow trout/southern steelhead. Additionally, the presence of fine sediment can also have a substantial

impact on the survival of rainbow trout/southern steelhead eggs and on the BMI community. Observations of the general abundance and diversity of aquatic insects in cobble and gravel substrates with relatively low amounts of fines (10% or less) indicated relatively low diversity and abundance of aquatic insects, although slightly increased numbers and diversity of organisms was noted in the vicinity of the weir. In locations where fine sediments comprised a greater percentage of the substrate (>10%), especially areas where a thin layer of sediment was present on all hard surfaces, very few aquatic insects were observed. In addition to the presence of fine sediment throughout most of the reach, the low numbers and diversity of aquatic insects may also be partially due to the time of year, since BMI communities are generally depressed during the winter with increasing abundance and diversity through the spring and early summer.

In general, very few aquatic organisms, other than California newts (*Taricha torosa*) which were common in some locations, were observed in the vicinity of the proposed restoration sites. The abundance of streamside riparian vegetation, especially in the lower gradient, depositional portions of the reach, likely provides a source of terrestrial insects to the stream, but the general lack of suitable habitat for fish precludes the presence of rainbow trout/southern steelhead.

Water Quality

Water quality measurements were obtained at two locations within the reach: immediately upstream of the grade control structure beneath the Highway 101 bridge and immediately upstream of the weir and concrete channel (Appendix B, Table B-6). Water quality values for all parameters tested were similar to those obtained in Reach 1. As expected temperature, conductivity, and TDS values were lowest at the weir, and highest at the mouth of the creek. All water quality parameters were within the normal range of values for coastal streams.

Existing aquatic habitat data is included in Appendix B.

2.4.5 Special-Status Wildlife Species

Special-status wildlife species are those species that have been given special recognition by federal, state, or local conservation agencies and organizations due to limited, declining, or threatened population sizes. This includes those species listed by the state and federal government as threatened or endangered, and those species proposed for state and/or federal listing or candidates. Special-status wildlife species that have the potential to occur in the project area are shown on Table 1.

Based on habitat associations, 80 special-status wildlife species were rated as having a low, moderate, or high potential for occurrence in Dos Pueblos Creek on the following basis (FEIR 2008):

- **Low** – known distribution well-documented; habitat in project area is marginal for species

- **Moderate** – known from a few records in Santa Barbara County; project area contains suitable habitat
- **High** – known from a number of records in Santa Barbara County; project area contains suitable habitat; focused surveys would likely document these species on site.

Table 1
Special-status Wildlife Species

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential for Occurrence
Invertebrates (10 species)				
Globose dune beetle, sandy beach tiger beetle, and Frost's tiger beetle	*Coelus globosus, Cicindela hirticollis gravida, Cicindela senilis frosti*	FSS/None	Sandy beach	*Cicindela hirticollis* Documented on site; *Coelus globosus* – moderate; *Cicindela. senilis* – low
Monarch butterfly	*Danaus plexippus*	None/CSC (overwintering sites)	Eucalyptus windrows (roost sites); grassland and scrub (foraging)	Observed 2004, 2005; known roosts in Dos Pueblos riparian corridor and adjacent eucalyptus windrows south of Highway 101 and elsewhere
Pinnacles optioservus riffle beetle	*Optioservus canus*	FSS/None	Riverine	Moderate
Point Conception Jerusalem cricket	*Ammopelmatus muwu*	FSS/None	Sand dunes	Low
San Diego fairy shrimp	*Branchinecta sandiegonensis*	Endangered/CSC	Natural and man-made seasonal pools	Low
San Francisco lacewing	*Nothochrysa californica*	FSS/None	Riparian woodland and scrub	Moderate
Santa Ynez Mountains walking stick	*Timema cristinae*	None/None/Local endemic	Chaparral	High
Vernal pool fairy shrimp	*Branchinecta lynchi*	Threatened/CSC	Natural and man-made seasonal pools	Observed in 2001 in man-made pools along UPRR tracks 0.5 miles W of Dos Pueblos Creek
Fish (3 species)				
Southern steelhead	*Oncorhynchus mykiss*	Endangered/CSC (Dos Pueblos Creek designated critical habitat)	Riverine	Probable historical occurrence in Dos Pueblos Creek watershed

Table 1
Special-status Wildlife Species

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential for Occurrence
Arroyo chub	*Gila orcutti*	None/CSC	Riverine	High; known from other streams in vicinity; suitable habitat in remainder of permanent reaches of Dos Pueblos Creek watershed
Tidewater goby	*Eucyclogobius newberryi*	Endangered/CSC	Estuarine and riverine	Low; probable historic occurrence in Dos Pueblos Creek, now extirpated
Amphibians (4 species)				
California red-legged frog	*Rana aurora draytonii*	Threatened/CSC	Riverine (eggs and larvae); riparian, riparian scrub, grassland, and coastal scrub (overwintering and dispersal)	Known from lower Dos Pueblos Creek in 1992 and Tomate Canada Creek (S of UPRR tracks) in 2005; probable elsewhere in these watersheds
Coast Range newt	*Taricha torosa torosa*	None/CSC (south of Salinas River in Monterey County)	Riverine (eggs and larvae); riparian, riparian scrub, grassland, and coastal scrub (overwintering and dispersal)	High
Foothill yellow-legged frog	*Rana boylii*	Threatened/CSC	Riverine	Low
Western spadefoot	*Scaphiopus hammondii*	None/CSC	Natural and man-made seasonal pools (eggs and larvae); grassland/scrub (oversummering and dispersal)	Low
Reptiles (5 species)				
California horned lizard	*Phrynosoma coronatum frontale*	None/CSC	Riparian scrub, coastal scrub, open chaparral and grassland	Moderate
Coast patch-nosed snake	*Salvadora hexalepis virgultea*	None/CSC	Coastal scrub, chaparral, open grassland	Moderate

Table 1
Special-status Wildlife Species

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential for Occurrence
Silvery legless lizard	*Anniella pulchra pulchra*	None/CSC	Oak woodland, coastal scrub, dune scrub, chaparral on sandy soils	High
Southwestern pond turtle	*Clemmys marmorata pallida*	None/CSC	Riverine, freshwater marsh, lakes, reservoirs, riparian scrub	Known from Dos Pueblos Creek watershed (date?) and from Tomate Canada Creek S of Highway 101 in 2005
Two-striped garter snake	*Thamnophis hammondii*	None/CSC	Riverine and adjacent scrub habitats; freshwater marsh, lakes, reservoirs, riparian scrub	High
Birds (43 species)				
Allen's hummingbird	*Selasphorus sasi*	Migratory Nongame Bird of Management Concern/Non	Riparian and eucalyptus woodland and riparian scrub (nesting)	Observed in Dos Pueblos Creek riparian corridor, 2004; probable elsewhere
American peregrine falcon	*Falco peregrinus anatum*	De-Listed/Endangered	Beaches, lagoons, reservoirs, etc., where prey congregate	Observed in project area in 2004, 2005
Bank swallow	*Riparia riparia*	None/Threatened	Riparian woodland	Low
Bell's sage sparrow	*Amphispiza belli belli*	None/CSC	Chaparral; coastal scrub	Moderate
Black swift	*Cypseloides niger*	None/CSC	Grasslands, riparian corridors, scrub	Moderate
Burrowing owl	*Athene cunicularia*	None/CSC	Grasslands, open scrub	Moderate
California brown pelican	*Pelecanus occidentalis californicus*	Endangered/Endangered	Beach and nearshore waters	Observed in 2004, 2005
California horned lark	*Eremophila alpestris actia*	None/CSC	Grassland, open scrub	Observed in 2004, 2005
California least tern	*Sterna antillarum browni*	Endangered/ Endangered	Protected sand beaches, estuaries, bays, harbors	Low

Table 1
Special-status Wildlife Species

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential for Occurrence
California thrasher	*Toxostoma redivivum*	Migratory Nongame Bird of Management Concern/None	Coastal scrub, chaparral, riparian scrub	Observed in 2005, 2005
Cooper's hawk	*Accipiter cooperi*	None/CSC	Oak woodland, riparian woodland, riparian scrub	Observed in 2004
Ferruginous hawk	*Buteo regalis*	None/CSC	Grasslands	Observed in 2005
Grasshopper sparrow	*Ammodramus savannarum*	None/None/CSC	Grasslands, open scrub	Observed in 2005
Lark sparrow	*Chondestes grammacus*	Migratory Nongame Bird of Management Concern/None	Grasslands, agricultural fields	Observed in 2004, 2005
Least Bell's vireo	*Vireo bellii pusillus*	Endangered/Endangered	Riparian woodland	Low
Loggerhead shrike	*Lanius ludovicianus*	None/CSC	Coastal scrub, open chaparral, oak savannah	Observed in 1005
Long-billed curlew	*Numenius americanus*	None/CSC	Grasslands	High
Long-eared owl	*Asio otus*	None/CSC	Riparian woodland, freshwater marsh	Historic record from reservoir area; moderate
Merlin	*Falco columbarius*	None/CSC	Beaches, lagoons, grasslands, etc., where prey congregate	Low
Mountain plover	*Charadrius montanus*	Threatened/CSC	Beach, grasslands	Low
Northern harrier	*Circus cyaneus*	None/CSC	Grasslands, open coastal scrub, chaparral	Observed in 2004, 2005
Olive-sided flycatcher	*Contopus cooperi*	Migratory Nongame Bird of Management Concern/None	Riparian woodlands	Moderate; potential nester in back canyons north of project area
Osprey	*Pandion haliaetus*	None/CSC	Nearshore waters, lagoons, reservoirs	Observed in 2004
Pacific-slope flycatcher	*Empidonax difficilis*	Migratory Nongame Bird of Management Concern/None	Riparian woodland, riparian scrub	Observed in 2004
Prairie falcon	*Falco mexicanus*	None/CSC	Grasslands, chaparral, coastal scrub	Low

Table 1
Special-status Wildlife Species

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential for Occurrence
Purple martin	*Progne subis*	None/CSC	Riparian woodland, riparian scrub, grasslands	Low
Red-breasted sapsucker	*Sphyrapicus ruber*	Migratory Nongame Bird of Management Concern/None	Riparian woodland, conifers, exotic trees	Moderate, wintering species only
Sharp-shinned hawk	*Accipiter striatus*	None/CSC	Riparian and oak woodland	High
Short-eared owl	*Asio flammeus*	None/CSC	Freshwater marsh, grasslands	Low
Southern bald eagle	*Haliaetus leucocephalus*	Threatened/Endangered, Fully Protected	Nearshore waters, reservoir	Historic record, low
Southern California rufous-crowned sparrow	*Aimophila ruficepscanescens*	None/CSC	Coastal scrub, chaparral, rocky grassland	Observed in 2004 and 2005
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered/Endangered	Riparian woodland	Observed in 2004
Swainson's thrush	*Catharus ustulatus*	None/None/CSC	Riparian woodland	Observed in 2004
Swainson's hawk	*Buteo swainsoni*	None/Threatened	Grasslands, open scrub	Moderate
Tricolored blackbird	*Agelaius tricolor*	None/CSC	Freshwater marsh, grasslands	Low
Vaux's swift	*Chaetura vauxi*	FSS/CSC	Riparian woodland, riparian scrub, grassland	Moderate
Warbling vireo	*Vireo gilvus*	None/None/Species of Local Concern	Riparian woodland	Moderate
Western meadowlark	*Wilsonia pusilla*	None/None/Species of Local Concern	Grassland, agricultural fields	Observed in 2004, 2005
Western snowy plover	*Charadrius alexandrines nivosus*	Threatened/CSC	Beach, sand dunes	Low
Western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	Proposed/Endangered	Riparian woodland	Low
White-tailed Kite	*Elanus leucurus*	None/Fully Protected	Grassland, eucalyptus woodland, orchards	Observed in 2004, 2005
Wilson's warbler	*Catharus ustulatus*	None/None/Species of Local Concern	Riparian woodland, riparian scrub	Observed in 2004

Table 1
Special-status Wildlife Species

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential for Occurrence
Yellow warbler	*Dendroica petechial brewsteri*	None/CSC	Riparian woodland	Observed in 2004
Yellow-breasted chat	*Icteria virens*	None/CSC	Riparian woodland	High
Mammals (15 species)				
American badger	*Taxidea taxus*	None/CSC	Grassland, riparian scrub, open chaparral and coastal scrub	High
Big free-tailed bat	*Nyctinomops macrotis*	None/CSC	Riparian woodland	Low
Fringed myotis	*Myotis thysanodes*	None/CSC	Riparian woodland, grasslands	Moderate
Harbor seal	*Phoca vitulina*	Federal Marine Mammal Act	Haul-out area on beach	Existing haul-out and pupping area located approximately 1,600 feet east of project area
Southern sea otter	*Enhydra lutris nereis*	Threatened	Nearshore marine	Moderate
Mountain lion	*Felis concolor*	None/Fully Protected	Grasslands, coastal scrub, chaparral, riparian woodland	Resident in project area (2005 mortality record for Hwy 101 at DP Creek)
Pallid bat	*Antrozous pallidus*	None/CSC	Grasslands, open scrub, riparian woodland	High
Red bat	*Lasiurus blossevillii*	None/CSC	Riparian woodland, oak woodland	High
Ringtail	*Bassariscus astutus*	None/Fully Protected	Riparian woodland, riparian scrub, chaparral coastal scrub	High
San Diego black-tailed jackrabbit	*Lepus californicus bennettii*	None/CSC	Grasslands, open scrub	Moderate to high
San Diego desert woodrat	*Neotoma lepida intermedia*	None/CSC	Rocky coastal scrub and chaparral	High
Spotted bat	*Euderma maculatum*	None/CSC	Riparian woodland, grasslands	Low
Townsend's big-eared Bat	*Corynorhinus townsendii townsendii* and *C.t. pallescens*	None/CSC	Riparian woodland, grasslands	Moderate
Western mastiff bat	*Eumops perotis*	None/CSC	Riparian woodland, rocky chaparral	Low

Table 1
Special-status Wildlife Species

Common Name	Scientific Name	Federal/State Status	Habitat Associations	Potential for Occurrence
Yuma myotis	*Myotis yumanensis*	None/CSC	Riparian woodland, aquatic habitats, freshwater marsh;	High

Dos Pueblos Creek has been designated as a critical habitat for the Southern California steelhead (*Oncorhynchus mykiss*) (FEIR 2008). Dos Pueblos Creek probably originally supported southern steelhead and tidewater goby (*Eucyclogobius newberryi*), but habitats for these species have been eliminated or severely modified. A vertical drop structure installed at the point where Highway 101 crosses Dos Pueblos Creek is approximately five feet high, and forms a barrier impassable to steelhead during most hydrologic conditions. It is possible that the structure may confine this species to the downstream portion of Dos Pueblos Creek. However, steelhead are capable of maintaining populations even when access to the sea is limited or eliminated, and there is potential for this species to occur in Dos Pueblos Creek both upstream and downstream of the existing diversion structure. Native partially -armored stickleback (*Gasterosteus aculeatus microcephalus*) and arroyo chub (*Gila orcutti*) may still also occur there in the creek, or in ponds or reservoirs along the creek, but must compete with or evade predation from non-native fish (bass, sunfish, carp, etc.) and red crayfish (*Procambarus clarkii*).

2.4.6 Vegetation Communities and Land Cover Types On Site

Annual Brome Grasslands (Semi-Natural Herbaceous Stand) (42.026.00)

Literature Review

Classification

The annual brome grassland semi-natural herbaceous stands are recognized by both the *List of Terrestrial Natural Communities* (CDFG 2003) and the *Natural Communities List* (CDFG 2010). There are 20 associations within the annual brome grassland semi-natural herbaceous stands (CDFG 2010). Annual brome grassland species including ripgut brome (*Bromus diandrus*) and soft brome (*Bromus hordeaceus*) are dominant or co-dominant species in the herbaceous layer (Sawyer et al. 2009).

Vegetation in this habitat type is composed primarily of non-native short to tall annual grasses and native and non-native broad-leafed forbs. Noxious weeds are also present in disturbed areas adjacent

to this habitat type. Dominant grasses include soft brome (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), foxtail chess (*Bromus madritensis),* wild oats (*Avena fatua*), Italian ryegrass (*Lolium multiforum*), and rat-tail fescue (*Vulpia myuros*).

Distribution and Biogeography

Annual brome grasslands are typically found on seasonally dry hillsides and valleys in the Central Valley, interior valleys of the Coast Ranges, and along the coast of central and southern California as well as some of the offshore islands. This mix of grasses and forbs is often found on gravelly to deep, fine-grained soils well suited for annual growth (Sawyer et al. 2009). Annual brome grasslands have open to continuous cover less than 0.75 meters (2.5 feet) in height; low cover of emergent trees and shrubs may be present. This community occurs from sea level to 2,200 meters (7,218 feet) above mean sea level (amsl) (Sawyer et al. 2009). Annual brome grasslands occur in scattered areas along Dos Pueblos Creek and are often the tree canopy understory.

Status

The annual brome grassland semi-natural herbaceous stands are ranked by the CDFG (2010) as an invasive species ranking. The California Invasive Plant Council (Cal-IPC) ranks ripgut brome as moderate and soft brome as moderate (Sawyer et al. 2009).

Arroyo Willow Thickets Alliance (61.201.00)

Literature Review

Classification

The arroyo willow thickets alliance is recognized by the *List of Terrestrial Natural Communities* (CDFG 2003), but not the *Natural Communities List* (CDFG 2010). There are eight associations within the arroyo willow thickets alliance (CDFG 2010). Arroyo willow thickets communities include arroyo willow (*Salix lasiolepis*) as the dominant or co-dominant shrub or tree in the canopy (Sawyer et al. 2009).

Some species associated with arroyo willow thickets include coyotebrush (*Baccharis pilularis*), mulefat (*B. salicifolia*), redosier dogwood (*Cornus sericea*), California sycamore (*Platanus racemosa*), and cottonwoods (*Populus* spp.) (Sawyer et al. 2009).

Distribution and Biogeography

Arroyo willow thickets occur throughout much of California except the desert regions. It occurs up to 2,170 meters (7,119 feet) amsl. The arroyo willow thickets alliance occurs along stream banks and

on stream benches. This alliance is also associated with slope seeps and stringers along drainages (Sawyer et al. 2009). Arroyo willow thickets occur in scattered areas along Dos Pueblos Creek associated with the riparian corridor.

Status

The arroyo willow thickets alliance is ranked by the CDFG (2010) as a G4S4 alliance. This ranking indicates that globally the alliance is apparently secure both globally and within California (CDFG 2010).

California Sycamore Woodlands Alliance (61.310.00)

Literature Review

Classification

The California sycamore woodlands (*Platanus racemosa*) alliance is recognized by both the *List of Terrestrial Natural Communities* (CDFG 2003) and the *Natural Communities List* (CDFG 2010). Within the alliance, there are 15 associations that include California sycamore as the dominant or codominant tree in the canopy. This alliance forms an open to intermittent tree canopy less than 115 feet (35 m) with an open to intermittent shrub layer and sparse or grassy ground layer (Sawyer et al. 2009).

The following species are associated with the California sycamore woodlands alliance: western white alder (*Alnus rhombifolia*), California walnut (*Juglans californica*), coast live oak (*Quercus agrifolia*), valley oak (*Quercus lobata*), Fremont cottonwood (*Populus fremontii* subsp. *fremontii*), California bay (*Umbellularia californica*), arroyo willow (*Salix lasiolepis*), Goodding's black willow (*Salix gooddingii*), and red willow (*Salix laevigata*) (Sawyer et al. 2009; NatureServe 2009; Holland 1986).

Distribution and Biogeography

The alliance is found in a variety of riparian locations, including gullies, intermittent streams, springs, stream and river banks, and seeps. It can also be found on terraces next to floodplains that are subject to high-intensity flooding.

Communities occur in soils that are permanently saturated with freshwater at depth. Soils are typically cobbly alluvium or rocky (Sawyer et al. 2009).

California sycamore woodlands occur in scattered areas along Dos Pueblos Creek associated with the riparian corridor.

Status

The California sycamore woodlands alliance is ranked by the CDFG (2010) as a G3S3 alliance. This ranking indicates that globally and within California the alliance is considered vulnerable and at modern risk (CDFG 2010; NatureServe 2009) and is also considered rare and of high priority (CDFG 2010).

Associations

A total of four California sycamore woodlands associations occur within the Dos Pueblos Creek riparian corridor. Two of these associations are recognized by both the List of Terrestrial Natural Communities (CDFG 2003) and the Natural Communities List (CDFG 2010); California sycamore woodlands and coast live oak association (61.321.01) and California sycamore woodlands and coast live oak with arroyo willow association (61.321.03). And two of these associations are not recognized by List of Terrestrial Natural Communities (CDFG 2003) and the Natural Communities List (CDFG 2010), however they have strong associations and percent cover within the Dos Pueblos Creek riparian corridor; California sycamore woodlands and arroyo willow association and California sycamore woodlands and coast live oak with annual brome grassland association.

Coast Live Oak Woodlands Alliance (71.060.00)

Literature Review

Classification

The coast live oak woodland or *Quercus agrifolia* alliance is recognized by both the *List of Terrestrial Natural Communities* (CDFG 2003) and the *Natural Communities List* (CDFG 2010). There are 41 associations within the coast live oak woodland alliance, mostly described by Allen et al. (1991). Coast live oak woodland alliance communities include coast live oak as the dominant or co-dominant tree in the canopy. Coast live oak woodland has a continuous to open canopy less than 98 feet (30 m) in height with a sparse to intermittent shrub canopy, and sparse or grassy ground layer (Sawyer et al. 2009).

Species associated with the coast live oak woodland alliance include big leaf maple (*Acer macrophyllum*), blue oak (*Quercus douglasii*), box elder (*Acer negundo*), California bay (*Umbellularia californica*), Engelmann oak (*Quercus engelmannii*), California sycamore (*Platanus racemosa*), California black walnut (*Juglans californica*), valley oak (*Quercus lobata*), arroyo willow (*Salix lasiolepis*), California black oak (*Quercus kelloggii*), and madrone (*Arbutus menziesii*) (Sawyer et al. 2009).

Distribution and Biogeography

The coast live oak woodland alliance occurs on alluvial terraces, canyon bottoms, stream banks, slopes, and flats. Soils in which this alliance is generally found are deep sands or loams with a high content of organic matter (Sawyer et al. 2009).

Coast live oak woodlands occur in scattered areas along Dos Pueblos Creek associated with the riparian corridor. However, most coast live oak trees are associated with California sycamore trees and are within the California sycamore woodlands and coast live oak association (61.321.01).

Status

The coast live oak woodland alliance is ranked by the CDFG (2009) as a G5S4 alliance. This ranking indicates that globally the alliance is widespread, abundant, and is considered secure (CDFG 2010; NatureServe 2009) and within California the alliance is apparently secure.

Eucalyptus Groves (Semi-Natural Woodland Stands) (79.100.00)

Literature Review

Classification

The Eucalyptus groves semi-natural woodland stands are recognized by both the *List of Terrestrial Natural Communities* (CDFG 2003) and the *Natural Communities List* (CDFG 2010). Eucalyptus groves semi-natural woodland stands communities include blue gum (*Eucalyptus globulus*), red gum (*Eucalyptus camaldulensis*), or other gum species as the dominant species in the tree canopy.

The groves have an intermittent to continuous tree canopy less than 50 meters (164 feet) in height. Understory shrub and herbaceous layers are sparse to intermittent.

Distribution and Biogeography

Throughout California, the eucalyptus grove semi-natural woodland stands occur on naturalized upland and stream courses as planted trees, groves, and windbreaks. Eucalyptus groves occur from sea level to 984 feet (300 m) amsl (Sawyer et al. 2009).

Eucalyptus groves semi-natural woodland stands occur in scattered areas along Dos Pueblos Creek associated with the riparian corridor.

Status

The eucalyptus groves semi-natural stands do not have a global or state ranking and is not considered sensitive by CDFW (CDFG 2010).

Fremont Cottonwood Forest Alliance (61.130.00)

Literature Review

Classification

The Fremont cottonwood forest alliance is recognized by both the *List of Terrestrial Natural Communities* (CDFG 2003) and the *Natural Communities List* (CDFG 2010). There are 20 associations within the Fremont cottonwood forest alliance. Fremont cottonwood forest alliance communities include Fremont cottonwood (*Populus fremontii*) as the dominant or co-dominant tree in the canopy. Fremont cottonwood forest has a continuous to open canopy less than 82 feet (25 m) in height with an intermittent to open shrub canopy, and variable herbaceous layer (Sawyer et al. 2009).

Species associated with the Fremont cottonwood forest alliance include boxelder (*Acer negundo*), Oregon ash (*Fraxinus latifolia*), Northern California black walnut (*Juglans hindsii*), California sycamore, California live oak, narrowleaf willow (*Salix exigua*), Goodding's black willow (*Salix gooddingii*), red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), Pacific willow (*Salix lasiandra*), and yellow willow (*Salix lutea*) (Sawyer et al. 2009).

Distribution and Biogeography

The Fremont cottonwood forest alliance occurs on floodplains, along low-gradient rivers, along perennial or seasonally intermittent streams, springs, in lower canyons in desert mountains, in alluvial fans, and in valleys with a dependable sub-surface water supply (Sawyer et al. 2009).

Freemont cottonwood forests occur in scattered areas along Dos Pueblos Creek associated with the riparian corridor.

Status

The Fremont cottonwood forest alliance is ranked by the CDFG (2009) as a G4S3 alliance. This ranking indicates that globally the alliance is apparently secure and within California the alliance is considered vulnerable and at modern risk (CDFG 2010; NatureServe 2009).

Giant Reed Breaks (Semi-Natural Herbaceous Stands) (42.080.00)

Literature Review

Classification

The giant reed breaks semi-natural woodland stands are recognized by both the *List of Terrestrial Natural Communities* (CDFG 2003) and the *Natural Communities List* (CDFG 2010). Giant reed breaks include giant reed (*Arundo donax*) as the dominant species in the herbaceous layer. In addition, giant reed breaks include giant reed as greater than 60% relative cover in the herbaceous and shrub layers (Sawyer et al. 2009).

Distribution and Biogeography

Throughout California, the giant reed break alliance occurs along low-gradient streams, riparian areas, ditches, and coastal marshes. This species is an introduced aggressive perennial grass that forms massive thickets of vegetation that can cover several hectares. Giant reed out-competes native plants, forms dense stands, and chokes riverbanks and stream channels. Giant reed breaks have a continuous canopy less than 26 feet (8 m) in height. They grow to a height of approximately 6 meters (20 feet) and occur from sea level to 1,641 feet (500 m) amsl (Sawyer et al. 2009).

Giant reed breaks occur in scattered monoculture stands within Dos Pueblos Creek and on the banks of Dos Pueblos Creek.

Status

The giant reed breaks semi-natural stands do not have a global or state ranking and is not considered sensitive by CDFW (CDFG 2010). However, Cal-IPC ranks giant reed as a high invasive species ranking.

Mulefat Thickets Alliance (63.510.00)

Literature Review

Classification

The mulefat thickets alliance is recognized by both the *List of Terrestrial Natural Communities* (CDFG 2003) and the *Natural Communities List* (CDFG 2010). Mulefat thickets alliance communities include mulefat (*Baccharis salicifolia*) as the dominant or co-dominant shrub in the canopy. Mulefat thickets have a continuous shrub canopy with the first tier less than 7 feet (2 m) in height and the second tier less than 5 meters (16 feet) in height with a sparse ground layer (Sawyer et al. 2009).

Species associated with the mulefat thickets alliance include willow (*Salix lasiolepis, S. exigua*) California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis*), tree tobacco (*Nicotiana glauca*), and laurel sumac (*Malosma laurina*). Emergent sycamore (*Platanus racemosa*), Fremont's cottonwood (*Populus fremontii*), oaks and willows may be present (Sawyer et al. 2009).

Distribution and Biogeography

Mulefat thickets occur in Trans-Pecos Texas, Baja California, Mexico, and California (NatureServe 2009). Within California, it occurs along the Southern, Central, and Northern Coasts; in the Great Valley; Mono; the Central California, Northern California, and Northern California Inter Coast Ranges; Klamath Mountains; Southern California Mountains and Valleys; lower montane elevations and foothills of the Sierra Nevada; Southeastern Great Basin; the Modoc Plateau; and the Mojave, Sonoran, and Colorado Deserts. Mulefat thickets occur between sea level and 4,101 feet (1,250 m) amsl (Sawyer et al. 2009).

The mulefat thickets alliance occurs in sandy watercourses, dry arroyos (NatureServe 2009), canyon bottoms, floodplains, irrigation ditches, lake margins, and stream channels on mixed alluvium soils (Sawyer et al. 2009).

Mulefat thickets occur in scattered areas along Dos Pueblos Creek associated with the riparian corridor.

Status

Mulefat thickets alliance is ranked by the CDFG (2010) as a G5S4 alliance. This ranking indicates that globally the alliances is widespread, abundant, and secure (CDFG 2010) and within California the alliance is apparently secure.

White Alder Groves Alliance (61.420.00)

Literature Review

Classification

The white alder groves (*Alnus rhombifolia*) alliance is recognized by both the *List of Terrestrial Natural Communities* (CDFG 2003) and the *Natural Communities List* (CDFG 2010). Within the alliance, there are 26 associations that include white alder as the dominant or codominant tree in the canopy. This alliance forms an open to continuous tree canopy less than 115 feet (35 m) with a sparse to continuous shrub layer and variable herbaceous layer (Sawyer et al. 2009).

The following species are associated with the white alder groves alliance: bigleaf maple (*Acer macrophyllum*), Port Orford cedar (*Chamaecyparis lawsoniana*), Oregon ash, California sycamore,

Fremont cottonwood, balsam poplar (*Populus trichocarpa*), Douglas-fir (*Pseudotsuga menziesii*), valley oak (*Quercus lobata*), and willow (*Salix* spp.) (Sawyer et al. 2009).

Distribution and Biogeography

The alliance is found in riparian corridors, incised canyons, seeps, stream banks, mid-channel bars, floodplains, and terraces.

White alder groves alliance does occur along Dos Pueblos Creek. However, white alder groves and California sycamore association (61.420.11) does occur.

Status

The white alder groves alliance is ranked by the CDFG (2010) as a G4S4 alliance. This ranking indicates that globally the alliance is apparently secure both globally and within California (CDFG 2010).

Associations

One white alder grove association, recognized by both the List of Terrestrial Natural Communities (CDFG 2003) and the Natural Communities List (CDFG 2010), occurs within the Dos Pueblos Creek riparian corridor; white alder groves and California sycamore association (61.420.11).

Agriculture

Agriculture refers to areas supporting farming cultivation. Specifically on Santa Barbara Ranch this includes avocado, citrus, macadamia nut and Cherimoya fruit tree production.

Developed

Developed land refers to areas supporting man-made structures including homes, yards, roadways, sidewalks, and other highly modified lands supporting structures associated with dwellings or other permanent structures. Vegetation in these areas, if present at all, is typically associated with development landscaping. Within the study area, developed land is limited to the southwestern portion of the proposed development, consisting of an existing private resident and associated landscaping.

Developed land is not included in the Natural Communities List (CDFG 2010). This community is not considered a special-status vegetation community by CDFW.

Non-native

Non-natives are not recognized by either the List of Terrestrial Natural Communities (CDFG 2003) or the Natural Communities List (CDFG 2010). However, this classification was included due to the diversity and percentage coverage of non-native species. Non-natives include giant reed (*Arundo donax*), coastal wattle (*Acacia cyclops*), New Zealand spinach (*Tetragonia tetragonioides*), and Cape-ivy (*Delairea odorata*). Non-native occurs at the mouth of Dos Pueblos Creek where the creek and Pacific Ocean meet.

Open Water

Literature Review

Classification

Open water is not recognized by either the *List of Terrestrial Natural Communities* (CDFG 2003) or the *Natural Communities List* (CDFG 2010), but is described by Gray and Bramlet (1992). Open water consists of standing water with no emergent vegetation. Open water is not considered a riparian habitat because it lacks hydrophytic vegetation. Open water can be regulated by CDFG, pursuant to Section 1602 of the California Fish and Game Code and the U.S. Army Corps of Engineers (ACOE), pursuant to Section 404 of the federal Clean Water Act (33 U.S.C. 1251 et seq.).

Distribution and Biogeography

Open water can occur in marine, estuarine, riverine, lacustrine, and palustrine systems. Open water provides aquatic habitat for waterfowl, fish, invertebrates, and amphibians. It is also a source of water for various land animals and a source of fish for birds. Open water has a wide distribution and variable biogeography.

Ornamental

Ornamental plantings refer to areas where non-native ornamentals and landscaping have been installed. Ornamental species present include Peruvian peppertree (*Schinus molle*), Canary Island date palm (*Phoenix canariensis*), and ornamental pines.

Ornamental communities are not included in the Natural Communities List (CDFG 2010). This community is not considered a special-status vegetation community by CDFW.

2.4.7 Special-Status Plants Species Potential to Occur On Site

Sensitive biological resources present or potentially present on site were identified through a search using the California Natural Diversity Database (CNDDB) (CDFW 2010). Table 2 below provides the results of a CNDDB search regarding sensitive plants species.

Table 2
Special-status Plant Species

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Blooming during survey?	Potential to Occur
Arctostaphylos refugioensis	Refugio manzanita	None/ None/ 1B.2	Chaparral(sandstone)/ perennial evergreen shrub/ Dec-Mar(May)/ 899-2690	Y	Not expected to occur. The site is outside of the species' known elevation range and there is no suitable vegetation present.
Atriplex coulteri	Coulter's saltbush	None/ None/ 1B.2	Coastal bluff scrub, Coastal dunes, Coastal scrub, Valley and foothill grassland/alkaline or clay/ perennial herb/ Mar-Oct/ 10-1509	Y	Moderate potential to occur. There is suitable coastal scrub and valley and foothill grassland on site. The nearest CNDDB record is within 7 miles of the site.
Atriplex serenana var. *davidsonii*	Davidson's saltscale	None/ None/ 1B.2	Coastal bluff scrub, Coastal scrub/alkaline/ annual herb/ Apr-Oct/ 33-656	Y	Low potential to occur. There is limited coastal scrub habitat on site.
Calochortus fimbriatus	late-flowered mariposa lily	None/ None/ 1B.3	Chaparral, Cismontane woodland, Riparian woodland/often serpentinite/ perennial bulbiferous herb/ Jun-Aug/ 902-6250	Y	Not expected to occur. The site is outside of the species' known elevation range.
Centromadia parryi ssp. *australis*	southern tarplant	None/ None/ 1B.1	Marshes and swamps(margins), Valley and foothill grassland(vernally mesic), Vernal pools/ annual herb/ May-Nov/ 0-1575	Y	Moderate potential to occur. There is suitable valley and foothill grassland on site. The nearest CNDDB record is within 2 miles of the site.
Cordylanthus rigidus ssp. littoralis	seaside bird's-beak	None/ CE/ 1B.1	Closed-cone coniferous forest, Chaparral(maritime), Cismontane woodland, Coastal dunes, Coastal scrub/sandy, often disturbed sites/ annual herb (hemiparasitic)/ Apr-Oct/ 0-1690	Y	Low potential to occur. There is suitable cismontane woodland and coastal scrub on the site. However, the site has limited amounts of these habitats on sandy soils.
Delphinium umbraculorum	umbrella larkspur	None/ None/ 1B.3	Cismontane woodland/ perennial herb/ Apr-Jun/ 1312-5249	Y	Not expected to occur. The site is outside of the species' known elevation range.

Table 2
Special-status Plant Species

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Blooming during survey?	Potential to Occur
Fritillaria ojaiensis	Ojai fritillary	None/ None/ 1B.2	Broadleafed upland forest(mesic), Chaparral, Cismontane woodland, Lower montane coniferous forest/rocky/ perennial bulbiferous herb/ Feb-May/ 738-3274	Y	Not expected to occur. The site is outside of the species' known elevation range and there is no suitable vegetation present.
Horkelia cuneata var. *puberula*	mesa horkelia	None/ None/ 1B.1	Chaparral(maritime), Cismontane woodland, Coastal scrub/sandy or gravelly/ perennial herb/ Feb-Jul(Sep)/ 230-2657	Y	High potential to occur. There is suitable cismontatne woodland and coastal scrub on site. The nearest CNDDB record is within 2 miles of the site.
Juncus luciensis	Santa Lucia dwarf rush	None/ None/ 1B.2	Chaparral, Great Basin scrub, Lower montane coniferous forest, Meadows and seeps, Vernal pools/ annual herb/ Apr-Jul/ 984-6693	Y	Not expected to occur. The site is outside of the species' known elevation range.
Lasthenia conjugens	Contra Costa goldfields	FE/ None/ 1B.1	Cismontane woodland, Playas(alkaline), Valley and foothill grassland, Vernal pools/mesic/ annual herb/ Mar-Jun/ 0-1542	Y	Moderate potential to occur. There is suitable cismontane woodland and valley and foothill grasslands on site.
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	None/ None/ 1B.1	Marshes and swamps(coastal salt), Playas, Vernal pools/ annual herb/ Feb-Jun/ 3-4003	Y	Low potential to occur. There is limited coastal salt marsh habitat on site.
Layia heterotricha	pale-yellow layia	None/ None/ 1B.1	Cismontane woodland, Coastal scrub, Pinyon and juniper woodland, Valley and foothill grassland/alkaline or clay/ annual herb/ Mar-Jun/ 984-5594	Y	Not expected to occur. The site is outside of the species' known elevation range.
Lonicera subspicata var. *subspicata*	Santa Barbara honeysuckle	None/ None/ 1B.2	Chaparral, Cismontane woodland, Coastal scrub/ perennial evergreen shrub/ May-Aug(Dec),(Feb)/ 33-3281	Y	High potential to occur. There is suitable coastal scrub habitat. The nearest CNDDB record within 5 miles of the site.
Monardella hypoleuca ssp. *hypoleuca*	white-veined monardella	None/ None/ 1B.3	Chaparral, Cismontane woodland/ perennial herb/ (Apr),May-Aug(Sep),(Oct),(Nov),(Dec)/ 164-5003	Y	High potential to occur. There is suitable cismontatne woodland on site. The nearest CNDDB record is within 2 miles of the site.

Table 2
Special-status Plant Species

Scientific Name	Common Name	Status (Federal/State/CRPR)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Blooming during survey?	Potential to Occur
Scrophularia atrata	black-flowered figwort	None/ None/ 1B.2	Closed-cone coniferous forest, Chaparral, Coastal dunes, Coastal scrub, Riparian scrub/ perennial herb/ Mar-Jul/ 33-1640	Y	High potential to occur. There is suitable riparian scrub on site. The nearest CNDDB record is within 2 miles of the site.
Senecio aphanactis	chaparral ragwort	None/ None/ 2B.2	Chaparral, Cismontane woodland, Coastal scrub/sometimes alkaline/ annual herb/ Jan-Apr/ 49-2625	Y	Low potential to occur. There is suitable cismontane woodland and coastal scrub on site.
Suaeda esteroa	estuary seablite	None/ None/ 1B.2	Marshes and swamps(coastal salt)/ perennial herb/ May-Oct(Jan)/ 0-16	Y	Low potential to occur. There is limited coastal salt marsh habitat on site.
Thelypteris puberula var. sonorensis	Sonoran maiden fern	None/ None/ 2B.2	Meadows and seeps(seeps and streams)/ perennial rhizomatous herb/ Jan-Sep/ 164-2001	Y	Moderate potential to occur. There is suitable stream habitat. The nearest CNDDB record is within 6 miles of the site.
Thermopsis macrophylla	Santa Ynez false lupine	None/ CR/ 1B.3	Chaparral(sandy, granitic, disturbed areas)/ perennial rhizomatous herb/ Apr-Jun/ 1394-4593	Y	Not expected to occur. The site is outside of the species' known elevation range and there is no suitable vegetation present.

2.4.8 Existing Agricultural Use

Agricultural uses within the site area include grazing and fruit and citrus orchards (avocado, macadamia nut, citrus, and cherimoya), staging and storage areas associated with agricultural activities, an artificial recreational pond, an abandoned agricultural water storage basin (basically dry at the time of the March 2015 Dudek survey), and various flood control and irrigation facilities including a water diversion weir and concrete channel/apron, abandoned floodgate, concrete bank and bed stabilization in numerous locations, several bridge crossings, drainage culverts, and low water "Arizona" crossings, both paved and unpaved.

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3 REGULATORY FRAMEWORK AND JURISDICTIONAL AREAS

3.1 Regulatory Framework

A key term in the IDA regarding SBR is to initiate planning to enhance areas of natural, scenic, wildlife, biological, open space, and drainage corridors within Dos Pueblos Creek consistent with ongoing agricultural use on lands within the Dos Pueblos Creek drainage.

This Restoration Plan addresses biological impacts that are anticipated to result from the proposed stream restoration work and which are regulated by both the federal CWA, administered by the ACOE and the RWQCB, the Porter-Cologne Water Quality Control Act, administered by the RWQCB, and the California Fish and Game Code, administered by the CDFW, the U.S. fish and Wildlife Service (USFWS) and the California Coastal Commission (CCC). This plan outlines on-site restoration strategies that will help fulfill the regulatory requirements of the federal CWA, the Porter-Cologne Water Quality Control Act, and the California Fish and Game Code for "no net loss of wetlands", as well as the USFWS for potential impacts to federally listed-endangered species and requirements of the California Coastal Act and/or Local Coastal Plan, as applicable.

3.2 Baseline Information and Jurisdictional Areas Affected

A formal site reconnaissance of the riparian creek corridor was conducted by Dudek and Balance Hydrologics staff on March 10 and 11, 2015, followed by updated GIS mapping, confirmation of riparian habitat boundaries and review of previous project documents and available technical studies. A formal wetlands delineation was not performed by Dudek as part of the initial field reconnaissance. A jurisdictional wetland delineation will need to be conducted at each of the proposed Restoration Area locations, in order to determine the full extent of waters of the U.S., including wetlands, under ACOE, CDFW, RWQCB, and CCC jurisdiction. The ACOE/RWQCB-jurisdictional wetlands will need to be delineated in accordance with the ACOE *1987 Manual for the Delineation of Wetlands (TR Y-87-1)*. Hydrology, hydrophytic vegetation, soils and aquatic habitat characteristics were examined at the potential wetland restoration site locations to determine the approximate limits of wetlands. Vegetation mapping was prepared on 150-scale (1 inch = 150 feet) project maps, overlaid onto an aerial photograph image of the site (Figures 5a-5l). A list of the vascular plant species detected within the project area is included in Appendix A.

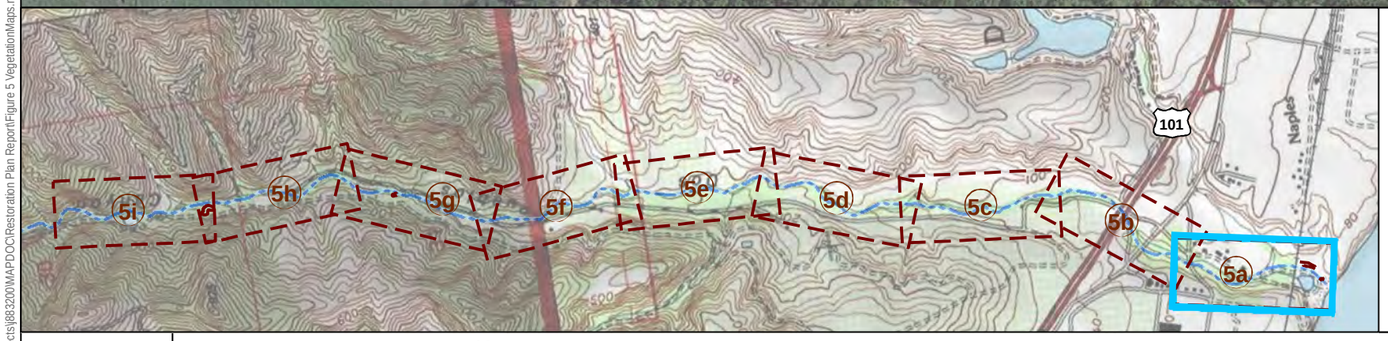
Existing hydrology in this area is driven by perennial and seasonal flow and runoff coming from the main drainage upstream, from secondary drainage sources to the west and east of the project area, as well as from drainage from agricultural runoff. High volume/high velocity flood flows are present during seasonal storms and fluctuations in storm water runoff characterize the site. Due to previous

sediment deposition in portions of the creek channel, the natural creek bed has been compromised and the presence of a desirable creek bed suitable for fish habitat has been compromised.

Results of the general site analysis and vegetation mapping concluded that the Project area likely supports wetlands and waters that fall under the jurisdiction of the ACOE per Section 404 of the CWA, the RWQCB per Section 401 of the CWA and the Porter-Cologne Water Quality Control Act, the CDFW per Section 1602 of the California Fish and Game Code, and the California Coastal Act and/or Local Coastal Plan, as applicable.

Implementation of the proposed project may result in impacts to riparian habitat under the joint jurisdiction of the ACOE, RWQCB, CDFW and CCC. Temporary impacts related to the stream restoration work, as well as potential permanent impacts related to the construction modifications to previous built structures will be determined once detailed construction plans are prepared.

The modified creek bed and banks (i.e., side slopes), will be restored with native riparian woodland and upland species where applicable. Disturbed non-native areas within the designate Restoration Areas will be converted to riparian woodland vegetation as part of the restoration effort. In addition, disturbed riparian habitat under the joint jurisdiction of the ACOE, RWQCB, CDFW and CCC will be enhanced through weed and exotic species removal and installation of additional riparian plant species. The enhancement areas will include the removal of mature non-native and invasive/exotic tree species from existing riparian woodland areas, in order to provide additional habitat enhancement. Exotic trees, shrubs and vining ground cover species observed within the creek habitat areas included, giant reed (*Arundo donax*), blue gum eucalyptus (*Eucalyptus globulus*), Pampas grass (*Cortaderia sellowana*), evergreen elm (*Ulmus parviflora*), castor bean (*Riccinus communis*), Sydney golden wattle (*Acacia latifolia*), tree tobacco, (*Nicotiana glauca*), Peruvian-pepper (*Schinus molle*), fennel (*Foeniculum vulgare*), castor-bean (*Ricinus communis*), Chinese elm (*Ulmus parvifolia*), date palm (*Phoenix dactylifera*), Mexican fan palm (*Washingtonia robusta*), myoporum (*Myoporum* sp.), Victorian box (*Pittospoum undulatum*), ash (*Fraxinus* sp.), greater periwinkle (*Vinca major*), cape ivy (*Delairea odorata*), hottentot fig/fig-marigold (*Carpobrotus edulis*), wisteria (*Wisteria cf. sinensis*), garden nasturtium (*Tropaeolum majus*) and giant yucca (*Yucca guatemalensis*). Many of the ornamental and exotic species are located within existing riparian areas and are currently infringing upon the establishment of desirable native species. Once these species are removed the resultant open areas will be supplemented with native replacement riparian woodland tree and shrub species to provide appropriate habitat conditions. In addition, the new realigned creek area, where indicated, will be revegetated with riparian vegetation.



Restoration Area

Dos Pueblos Creek Approx. Centerline

Vegetation Community and Land Cover

AGR - General Agriculture

AWT - Arroyo willow thickets

CLOW - Coast live oak woodland

CSW - California sycamore woodlands

CSW/AWT - California sycamore woodlands/Arroyo willow thickets

EG(SNS) - Eucalyptus grove

GRB - Giant reed breaks

Non-native

ORN - Parks and ornamental plantings

OW - Open water

AERIAL SOURCE: Google Maps 2015

0 50 100 200 Feet

DUDEK

FIGURE 5a

Vegetation Map 1

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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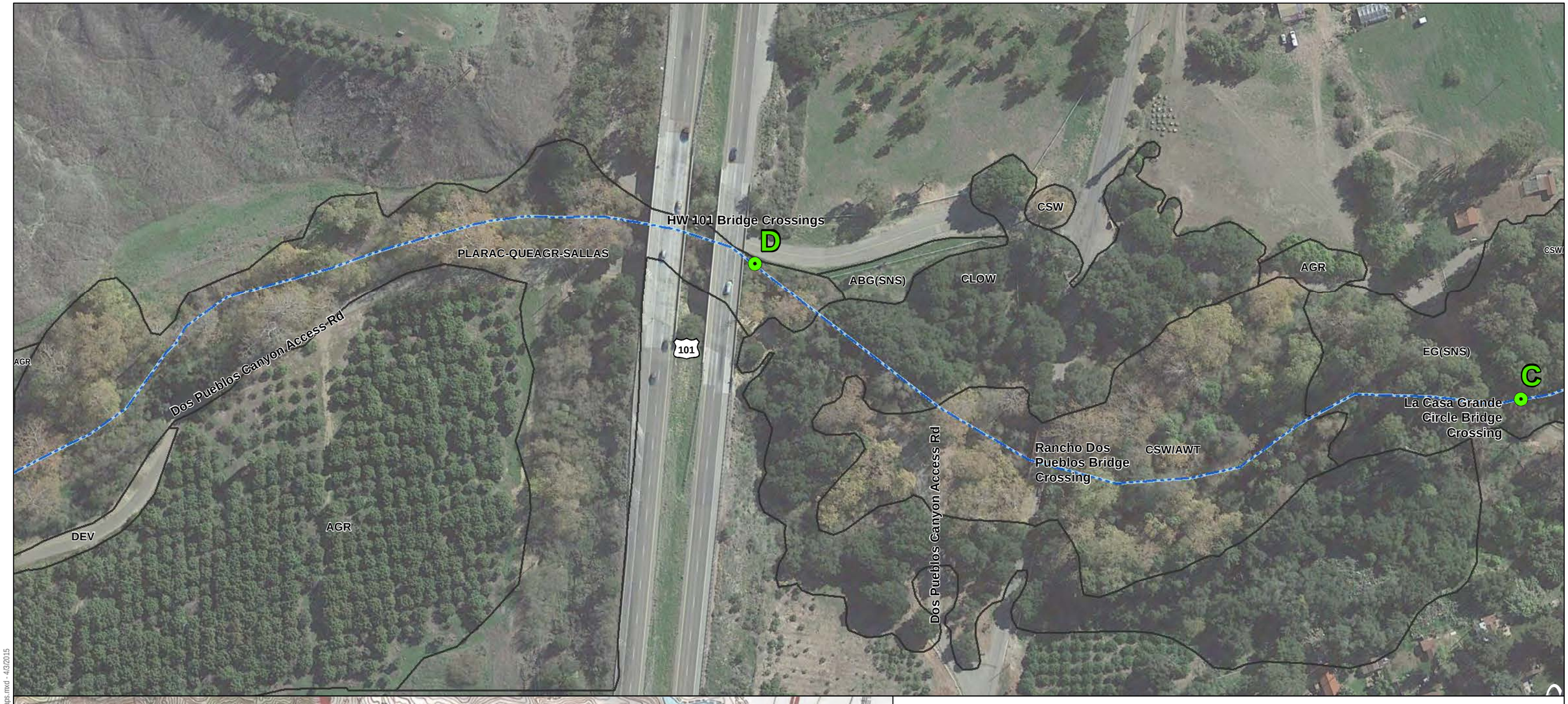

Restoration Area

Dos Pueblos Creek Approx. Centerline

Vegetation Community and Land Cover

ABG(SNS) - Annual brome grassland

AGR - General Agriculture

CLOW - Coast live oak woodland

CSW - California sycamore woodlands

CSW/AWT - California sycamore woodlands/Arroyo willow thickets

DEV - Urban/Developed

EG(SNS) - Eucalyptus grove

PLARAC-QUEAGR-SALLAS - California sycamore-coast live oak-arroyo willow

AERIAL SOURCE: Google Maps 2015

0 50 100 200 Feet

DUDEK

FIGURE 5b

Vegetation Map 2

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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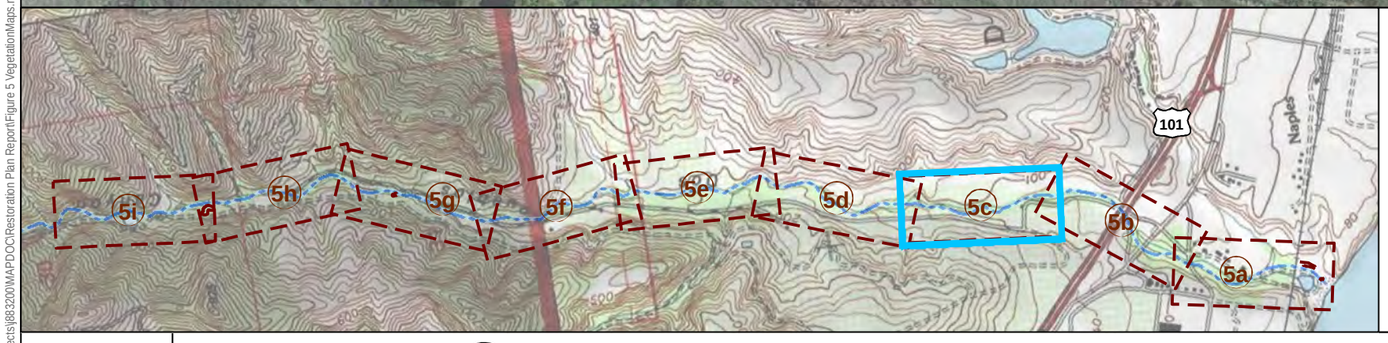

Restoration Area

Giant Reed

Dos Pueblos Creek Approx. Centerline

Vegetation Community and Land Cover

AGR - General Agriculture

DEV - Urban/Developed

PLARAC-QUEAGR - California sycamore-coast live oak

PLARAC-QUEAGR-SALLAS - California sycamore-coast live oak-arroyo willow

AERIAL SOURCE: Google Maps 2015

0 50 100 200 Feet

DUDEK

FIGURE 5c

Vegetation Map 3

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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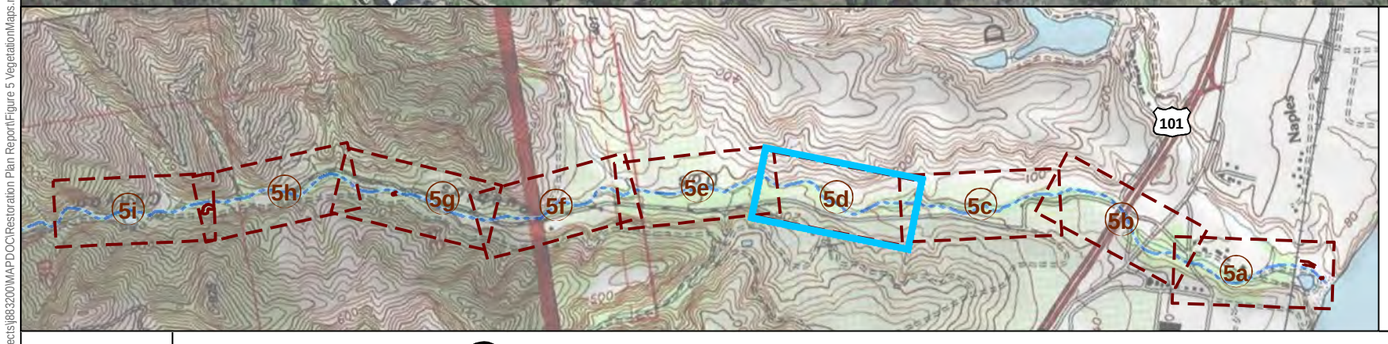

Restoration Area

Dos Pueblos Creek Approx. Centerline

Vegetation Community and Land Cover

AGR - General Agriculture

CSW/AWT - California sycamore woodlands/Arroyo willow thickets

EG(SNS) - Eucalyptus grove

PLARAC-QUEAGR - California sycamore-coast live oak

PLARAC-QUEAGR-SALLAS - California sycamore-coast live oak-arroyo willow

AERIAL SOURCE: Google Maps 2015

0 50 100 200 Feet

DUDEK

FIGURE 5d

Vegetation Map 4

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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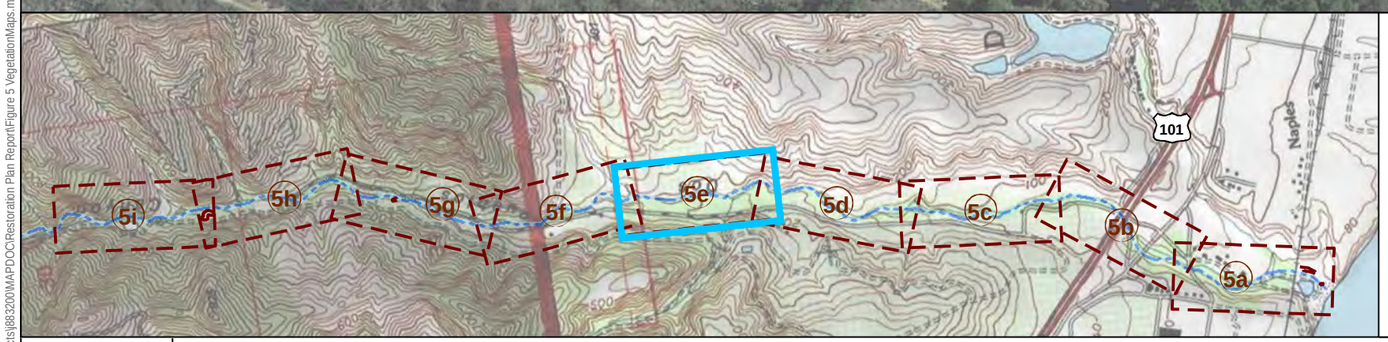

Restoration Area

Dos Pueblos Creek Approx. Centerline

Vegetation Community and Land Cover

AGR - General Agriculture

CLOW - Coast live oak woodland

PLARAC-QUEAGR-SALLAS - California sycamore-coast live oak-arroyo willow

PLARAC-QUEAGR/BRODIA - California sycamore-coast live oak/annual brome grassland

AERIAL SOURCE: Google Maps 2015

0 50 100 200 Feet

DUDEK

FIGURE 5e

Vegetation Map 5

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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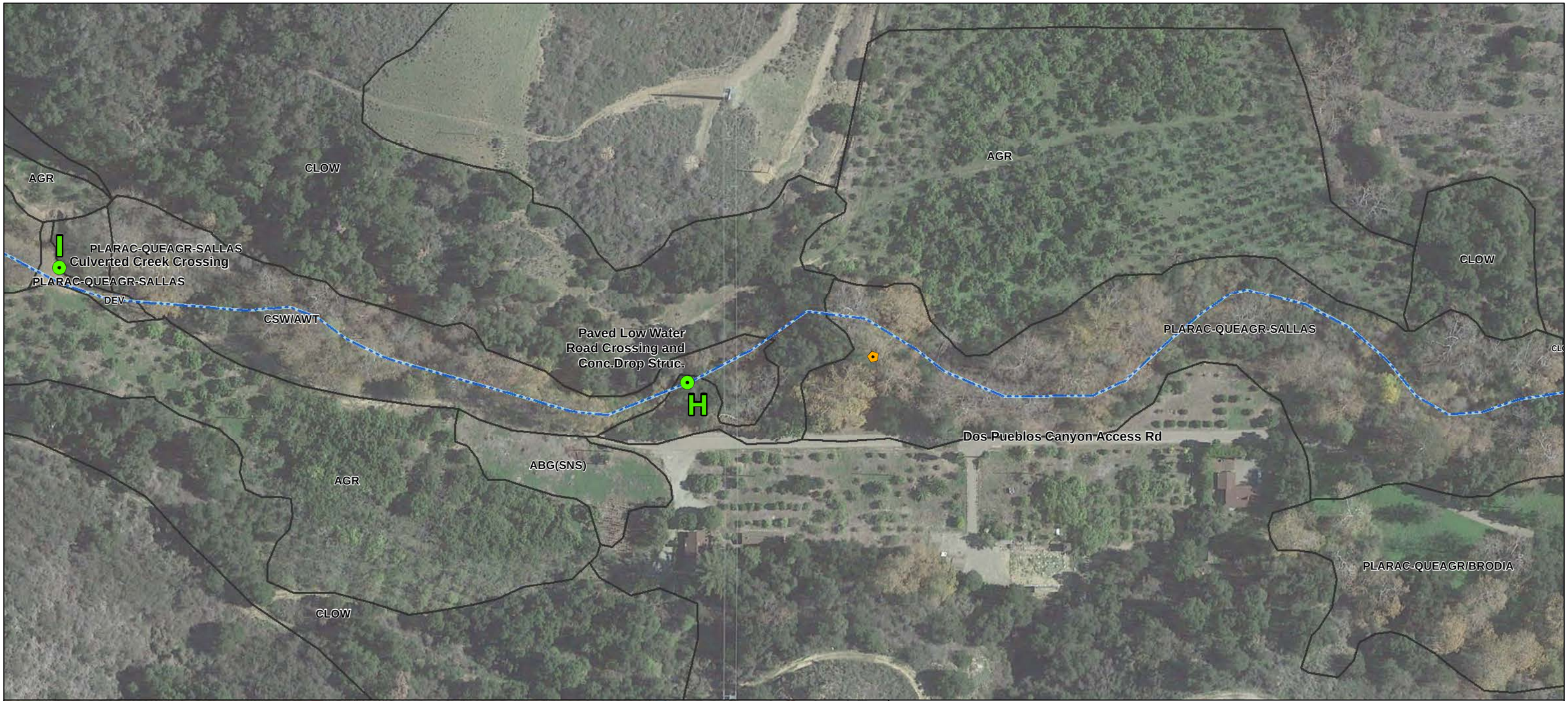

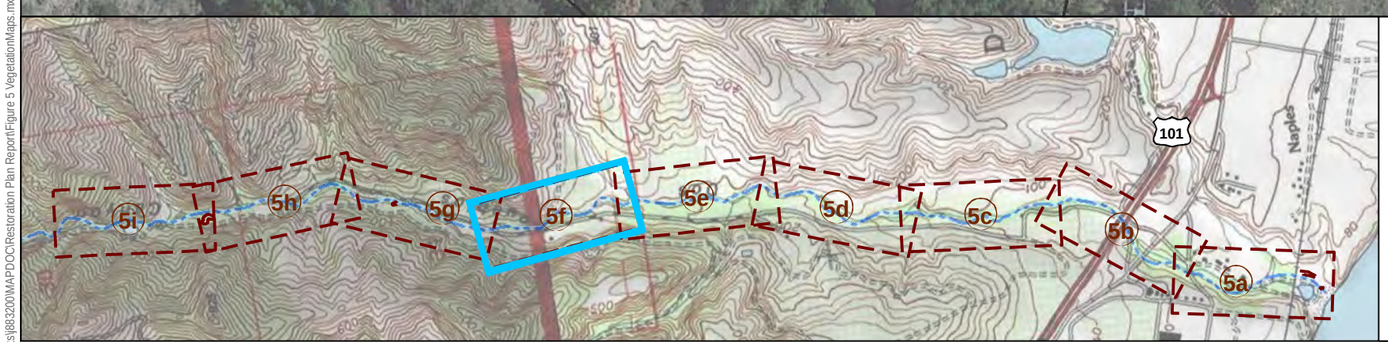

- Restoration Area
- Giant Reed
- Dos Pueblos Creek Approx. Centerline

Vegetation Community and Land Cover

- ABG(SNS) - Annual brome grassland
- AGR - General Agriculture
- CLOW - Coast live oak woodland
- CSW/AWT - California sycamore woodlands/Arroyo willow thickets
- DEV - Urban/Developed
- PLARAC-QUEAGR-SALLAS - California sycamore-coast live oak-arroyo willow
- PLARAC-QUEAGR/BRODIA - California sycamore-coast live oak/annual brome grassland

AERIAL SOURCE: Google Maps 2015

0 50 100 200 Feet

DUDEK

FIGURE 5f

Vegetation Map 6

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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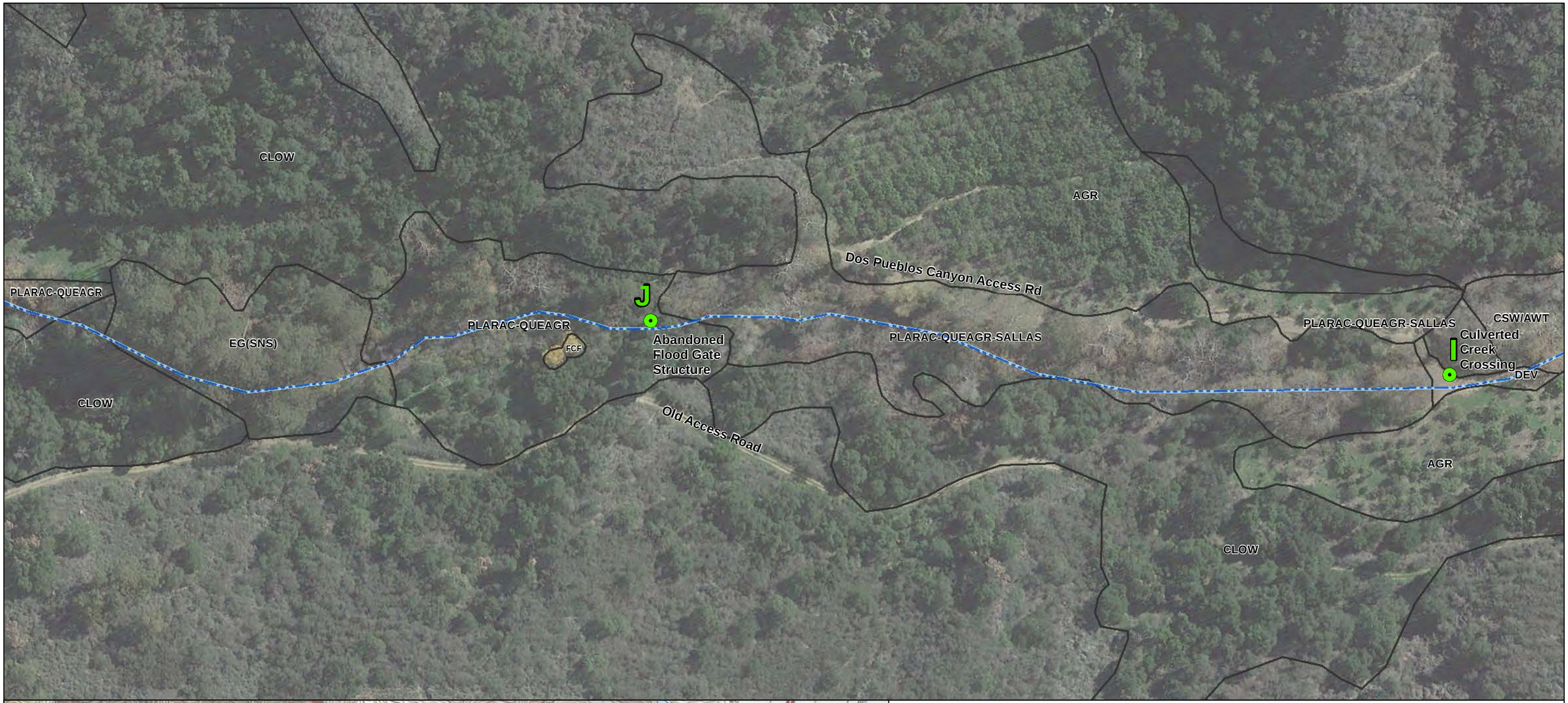

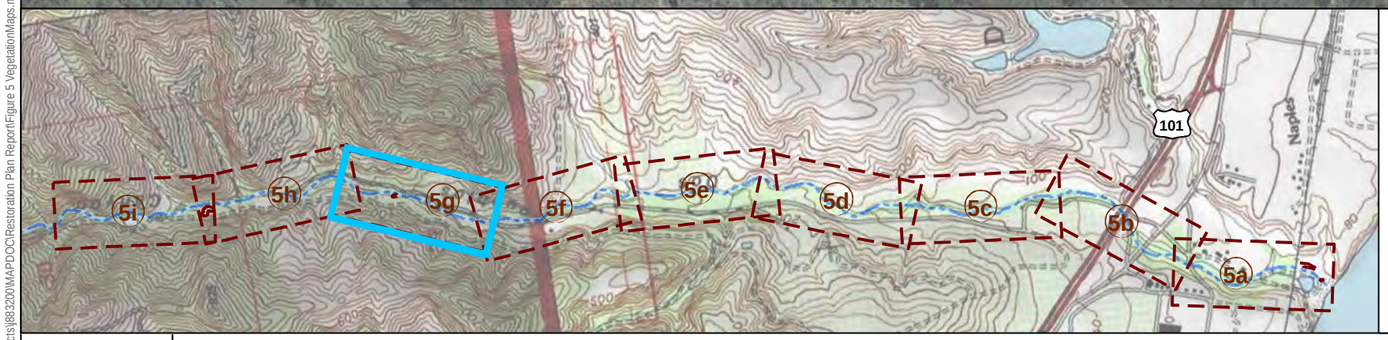

Restoration Area

Dos Pueblos Creek Approx. Centerline

Vegetation Community and Land Cover

AGR - General Agriculture

CLOW - Coast live oak woodland

CSW/AWT - California sycamore woodlands/Arroyo willow thickets

DEV - Urban/Developed

EG(SNS) - Eucalyptus grove

FCF - Fremont cottonwood forest

PLARAC-QUEAGR - California sycamore-coast live oak

PLARAC-QUEAGR-SALLAS - California sycamore-coast live oak-arroyo willow

AERIAL SOURCE: Google Maps 2015

0 50 100 200 Feet

DUDEK

FIGURE 5g

Vegetation Map 7

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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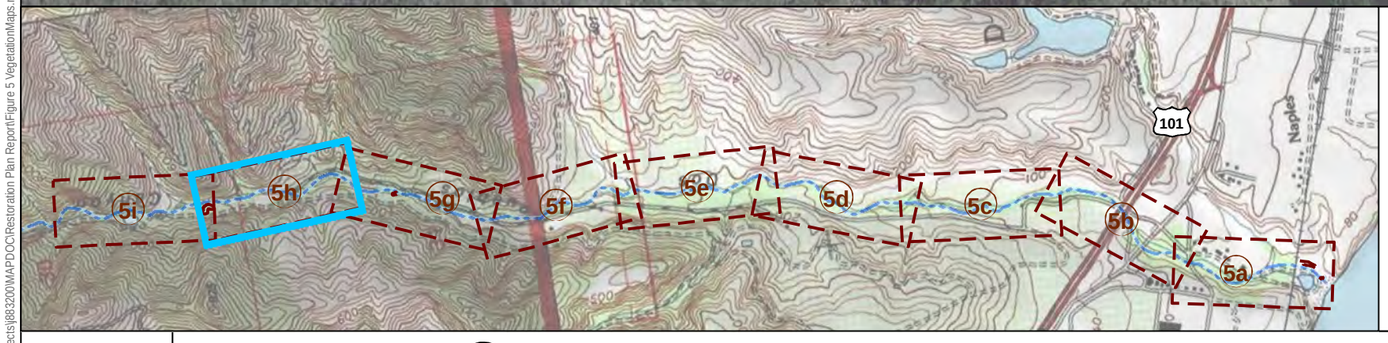

Restoration Area

Dos Pueblos Creek Approx. Centerline

Vegetation Community and Land Cover

ABG(SNS) - Annual brome grassland

CLOW - Coast live oak woodland

CSW - California sycamore woodlands

EG(SNS) - Eucalyptus grove

PLARAC-QUEAGR - California sycamore-coast live oak

AERIAL SOURCE: Google Maps 2015

0 50 100 200 Feet

DUDEK

FIGURE 5h

Vegetation Map 8

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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Restoration Area

Dos Pueblos Creek Approx. Centerline

Vegetation Community and Land Cover

ALNRHO-PLARAC - White alder-California sycamore

BACPIL - Coyote brush

CLOW - Coast live oak woodland

CSW - California sycamore woodlands

EG(SNS) - Eucalyptus grove

AERIAL SOURCE: Google Maps 2015

0 50 100 200 Feet

DUDEK

FIGURE 5i

Vegetation Map 9

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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3.3 Functions and Services of Jurisdictional Areas Affected by the Proposed Work

The existing riparian resources on site, while moderately to severely disturbed by exotic/non-native species, sediment accretion, and other anthropogenic disturbances, provide a filtering effect for the non-point source runoff from agricultural areas adjacent to Dos Pueblos Creek and serve to catch and trap pollutants as they travel through the system. These functions will be disturbed during restoration construction, but will not be permanently lost, as the vast majority of these areas will be restored in place, and/or will be replaced with another form of riparian vegetation. Additional compensation will also be provided for the disturbances/impacts through the removal of non-native/exotic plant species. Therefore, this effort will ultimately provide additional and improved riparian habitat quality on site. The existing southern willow scrub and disturbed southern willow scrub habitat provides cover for wildlife species, primarily avian bird species, in addition to aquatic species. However, the presence of non-native vegetation compromises the full functions and services that can be recognized.

3.3.1 Existing Aquatic and Hydrologic Functions and Services

Beneficial Uses of Dos Pueblos Canyon Creek, in its current configuration, include (RWQCB 2011):

- municipal and domestic supply;
- agricultural supply;
- industrial process supply;
- ground water recharge;
- water contact recreation;
- non-contact water recreation;
- wildlife habitat;
- cold fresh water habitat;
- warm fresh water habitat;
- migration of aquatic organisms;
- spawning, reproduction and/or early development;
- rare, threatened, or endangered species; estuarine habitat; and
- freshwater replenishment.

In addition to the beneficial uses listed above from the RWQCB Basin Plan, Dos Pueblos Creek provides short term water storage, dispersal of flood flow conveyance, and pollutant and sediment

deposition. Perennial creek flow and nuisance water runoff is currently carried throughout the year. Surface water quality is affected by untreated runoff flowing from orchard land, cattle-grazing land, residences, and roadways (FEIR 2008). Since runoff is generated from multiple sources, the resultant contamination is considered non-point source pollution. The land uses within the project area that contribute to such non-point source pollution are typical of those along the Gaviota Coast or in similar rural agricultural areas. There is one permitted discharger—the aquaculture plant located on the DPR property near the Dos Pueblos Creek outfall location at the Beach. This facility raises abalone with seawater pumped into tanks and then discharged into the ocean through outfall pipes. The facility operates under NPDES Permit No. CAG99300, and discharges approximately 3.6 million gallons per day (gpd) of untreated sea water (FEIR 2008).

The non-native/invasive exotic plant species, such as giant reed, cape ivy, garden nasturtium, and eucalyptus, have also lead to the clogging of the creek, impedance of the creek flows and competition with the more desirable native wetland species.

Based on stream habitat information obtained during the two-day site assessment and review of documents pertaining to Dos Pueblos Creek, the existing aquatic habitat within the project area has been highly affected by channelization, installation of structures and culverts that limit and possibly preclude upstream movement of fish, channel incision, high levels of fine sediments, and to a lesser degree, invasive vegetation. The effects of the above activities have resulted in degraded stream conditions throughout the project reaches, including barriers to upstream fish movement, and sedimentation and siltation of pools and rock substrates which reduce or eliminate rainbow trout/ southern steelhead and BMI habitat. As a result, Dos Pueblos Creek within the project area does not currently provide some of the aquatic habitat functions and services necessary to support a healthy aquatic community.

The primary barriers to upstream fish movement occur at the grade control structure beneath the Highway 101 bridge and at the creek diversion/weir structure, although passage through the drainage culvert creek crossing (twin culverts approximately 30 inches in diameter) could also be difficult or impossible during high flow periods. Additionally, depending on the beach elevation at the seaward lip of the concrete spillway apron at the mouth of the creek, southern steelhead entering the creek from the ocean could be difficult or impossible. During the winter when southern steelhead typically enter coastal streams, when winter storms have removed much of the beach substrates, a drop of about 2 ft. (0.6 m) to the beach surface has been observed at the mouth. The absence of a jump pool at the base of the spillway would make entry into the creek very difficult unless tides and wave action provided water up to the spillway.

Habitat for rainbow trout/ southern steelhead spawning, juvenile rearing, and adult holding within the project reach is highly limited, and even when present, is generally degraded. The primary factor

impacting the quality of rainbow trout/ southern steelhead habitat is the presence of relatively high levels of fine sediments within much of the project reach. Sediment observed within the creek appears to originate from several sources within the project area including channel erosion (especially in areas where the creek is incised) and erosion of soil from around the two culverts at the drainage culvert creek crossing. Additionally, based on the amount of fine sediment observed in and adjacent to the creek channel upstream of the weir and concrete channel, indicates that relatively large amounts of sediment are also moving into the project reach from upstream areas. The source of this sediment is currently unknown; however, information provided in section 9.2 Geology, Geologic Hazards, and Soils of the EIR, identifies the coastal foothills as an area containing fairly severe landslide problems, and that widespread landslides occur over much of the slopes containing Rincon Shale. It is possible that some of these landslides have occurred in the upper reaches of Dos Pueblos Creek and may be contributing sediments to the creek on an ongoing basis.

In the lower reach of the creek, downstream of the La Casa Grande bridge, fine sediment dominates the substrate, eliminating habitat for rainbow trout/southern steelhead and other fish species and most aquatic insects. Upstream of the La Casa Grande bridge, increased stream gradient and the presence of a natural channel with boulder, cobble, and gravel substrates creates improved habitat conditions, although fine sediment was still present (primarily in pockets). The number and diversity of aquatic insects appeared to increase slightly in comparison to the channelized section, although the numbers of aquatic insects was still very low.

The apparently generally poor condition of BMI communities observed within the reach during the site assessment (i.e., low diversity and abundance) is likely a limiting factor (along with the general lack of deep pools and instream cover, and the overall abundance of fine sediment) for the rainbow trout/ southern steelhead population within, at least, the project reach. However, since the site assessment was conducted early in the year when BMI communities are typically at reduced levels, the low abundance and diversity may not be representative of BMI communities in the creek during the summer. During the site assessment, only one very slender rainbow trout (which likely had a low condition index score) was observed within the overall project reach. Based on the generally low numbers of aquatic insects observed throughout most of the project reach, the relatively poor body condition was likely due to limited food resources.

In California, stream bio-assessment using the State Water Resources Control Board's Surface Water Ambient Monitoring Program (SWAMP) is the primary tool currently being used for evaluating stream health. Bio-assessments typically include an assessment of the BMI and algal communities, as well as associated physical habitat parameters. However, even though a stream bio-assessment has not been conducted on this creek, the level of degraded habitat observed during the site assessment and the generally low numbers and diversity of aquatic insects within the project area indicates poor stream health. The core principles of aquatic bio-assessments are 1) resident organisms provide a record of water body

conditions over time, 2) monitoring provides a direct measure of water body health, 3) ecological indicators provide a useful context for interpreting other water quality measures (e.g., chemistry), and results are compared with reference site conditions to determine the level of impairment.

Additionally, the California Stream Condition Index (CSCI) is also available for measuring stream health since it combines two approaches to assessing biological health: the species loss component (Observed/Expected [O/E]) where the test site is compared with similar regional reference sites; and the ecological structure component which provides a better reference data set, more comprehensive, site-specific expectations, and statewide applicability. CSCI predicts the species and metric values to expect (E) at a test site based on natural environmental factors including: location (elevation, latitude, longitude), watershed size, climate (precipitation and temperature), and geology (mineral content, soils).

The collection of SWAMP stream bio-assessment data and determination of the CSCI can then be used to help identify existing physical stressors on stream habitats and its effect on associated aquatic species and the determination of the types of restoration activities that can be implemented to reduce these stressors and improve the overall functioning of the creek, aquatic habitats, and the aquatic species using these habitats.

3.3.2 Existing Vegetation Community Habitat Functions and Services

The Dos Pueblos creek channel (i.e., creek bed and creek bank) and adjacent floodplain contain riparian and upland vegetation. Riparian woodland, dominated by coast live oak (*Quercus agrifolia* var. *agrifolia*), California bay laurel (*Umbellularia californica*), western sycamore (*Platanus racemosa*), red willow (*Salix laevigata*), and arroyo willow (*Salix lasiolepis*) characterize a majority of the most native and high quality habitats of Dos Pueblos Creek. Non-native invasive species which achieve localized dominance either in the tree canopy or understory within the riparian woodland include greater periwinkle, cape ivy, wisteria, blue gum eucalyptus, garden nasturtium, giant yucca, and giant reed. Openings within the riparian woodland canopy within the floodplain of Dos Pueblos canyon support a tall scrub dominated by coyote bush (*Baccharis pilularis*) and with frequent emergent species including blue elderberry (*Sambucus nigra* ssp. *caerulea*), laurel sumac (*Malosma laurina*), California sagebrush (*Artemisia californica*), black sage (*Salvia mellifera*), big-pod ceanothus (*Ceanothus megacarpus* var. *megacarpus*), green-bark ceanothus (*Ceanothus spinosus*), and others in lesser numbers. Also present within upland slopes is the special-status species, Santa Barbara honeysuckle (*Lonicera subspicata* var. *subspicata*, CNPS List 1B.1). Special status plant species that are known to occur in Dos Pueblos Creek are depicted below in Table 1. A full listing of the plant species observed within the project area is included in Appendix A.

Although not achieving dominance over large areas of the creek, non-native species that have become naturalized, are common, and can be considered a detriment to the functions and services

provided by the creek include giant reed, hottentot fig/fig-marigold, Peruvian-pepper, fennel, castor-bean, Chinese elm, date palm, and Mexican fan palm.

Disturbed and/or agricultural areas of the site include fruit orchards (avocado, citrus, macadamia and cherimoya), staging and storage areas associated with agricultural activity, an artificial agricultural storage pond, an abandoned recreational pond, and various flood control and irrigation facilities including a weir and concrete apron structure, abandoned floodgate, concrete channel bank and bed stabilization, a bridge, drainage culverts, and low water "Arizona" crossings, both paved and unpaved.

Native riparian vegetation on site helps to reduce erosion by shielding the soil surface from direct water impact, slows water flow, and provides root systems that help to hold soil in place during flow events. Plants also improve the soil quality and richness by contributing organic matter, which helps improve soil structure, microbiota, and insect habitat. Plants help to uptake nutrients, and some species are able to uptake metals. Riparian vegetative cover can result in lower water temperatures and lessen evaporation rates. Vegetative cover also provides nesting and foraging habitat for a wide variety of bird and animal species.

Due to the size and location of the site and its private ownership status, the site does not lend itself well to recreational use, fishing, or hunting activities. However, rainbow trout were observed in a splash pool below the upper weir (i.e., Impact Sciences 2010 observations). One trout was also observed in an isolated pool south of the Hwy. 101 bridge, under the La Casa Grande Circle access road bridge (Dudek 2015 observations). Southern steelhead have also been observed using the creek in the past (personal communications). Additional aquatic biota are presumed to occur in intermittent streams, seasonal water bodies, and seeps within the area and would include invertebrates and amphibians that complete the aquatic part of their life cycle during the wet period or have special adaptations to survive when the water body is dry [e.g., California clam shrimp (*Cyzicus californicus*)]. Perennial surface water habitats in the area typically support other species of invertebrates and vertebrates that require one or more years for completion of their life cycle. Current sediment conditions and degraded creek bed conditions within the Dos Pueblos Creek project area appear to be precluding healthy aquatic biota from inhabiting the creek and may be compromising the food source for fish habitat.

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4 WETLANDS RESTORATION PROGRAM

4.1 Location, Size, and Present/Proposed Uses of Restoration Areas

The proposed Restoration Areas will be located within disturbed areas of the creek, as well as within other adjacent areas outside of the immediate creek bed and bank, which are currently composed of non-native/invasive vegetation, including ornamental trees, shrubs and groundcovers, as well as other invasive species such as giant reed and castor bean. The Restoration Areas will include revegetation of all disturbed areas within the Restoration Area boundaries. Within these areas, riparian areas will be restored and enhanced, and existing riparian habitat will be preserved.

The Restoration Areas and the associated enhancement areas will be planted with native species from container plants as well as from hydro-seeding. A mixture of native riparian and upland species will be utilized. All creek restoration and enhancement areas will be maintained and monitored for a proposed long-term five-year period and will be subject to the performance guidelines discussed in Sections 6 and 7.

The proposed restoration and enhancement areas currently support primarily disturbed, degraded or developed habitat conditions that currently provide minimal biological value because of their disturbed/degraded conditions and do not support high quality native riparian vegetation.

The proposed modifications within the Restoration Areas are aimed at providing improved native riparian vegetation, are intended to help improve flood flow/drainage conveyance and help provide short-term storage, and are envisioned to provide increased riparian habitat functions and services and improvement to wildlife habitat through restoration to natural conditions and revegetation with native species. The Restoration Areas will be preserved and managed in perpetuity as natural open space.

The modifications to the various stream crossings addressed in this plan (i.e., paved and unpaved creek crossings) can be achieved at each location by either eliminating the crossing altogether and replacing it with an alternative access route which avoids a creek crossing; or through the physical modifications at each crossing as described in this plan. The overriding goal is to provide a natural soft bottom creek condition conducive to fish passage and to have the area undisturbed by direct vehicular access through the creek. Access over the creek at these existing crossings will be acceptable as long as a soft bottom arch culvert or alternative bridge structure is utilized.

4.2 Restoration Area Strategies: Areas South of Hwy 101 (Dos Pueblos Ranch Property)

Restoration Area A: Channelized Creek

The approximate 1,000 foot long section of the creek at Restoration Area A, from the beach to the beach access road bridge (i.e., described as Restoration Area B), that had been previously channelized into a concrete trapezoidal channel, will be modified to provide improved creek bed and bank conditions and improved riparian habitat. Existing sediment within the channel not currently supporting native wetland vegetation will be removed. Within portions of the creek bed that have been previously broken, undermined or compromised, the creek channel bottom will be modified to remove the concrete channel bottom lining. These areas will be replaced with native boulders, cobble and gravel to improve the creek fish habitat. Portions of the earthen creek banks that have been eroded and/or are infested with non-native exotic vegetation will be re-graded, re-stabilized with alternative creek banks measures, such as willow wattles, coir logs and blankets and will be planted with appropriate native riparian species. The previous riparian vegetation that has naturally recolonized within the creek and has rooted through into the bottom of the creek channel, will remain in place and will be preserved. Any non-native invasive species within 20 feet of the creek channel bank will be removed and replaced with appropriate native riparian species.

At the far south end of the channel, where the concrete sloping channel bottom surface ends, with an approximate 2 ft. vertical drop-off to the beach exists, the channel will be modified to create a series of stair-step transitional one foot drop structure step pools, with a cobble and gravel substrate, to better modulate flow and to provide fish accessibility. Upstream of this location a more natural four foot wide pilot channel will be cut into the center of the concrete channel bottom and will be filled with boulders, cobble and gravel to provide a better transitional substrate for fish passage.

Alternative locations for the drainage outfall from the Aquaculture pump facility should be explored to avoid immediate discharge at the same location as the creek outfall. Currently the saltwater outfall from the aquaculture facility drains directly into the sand and cobble substrate and inter-mixes with the creek freshwater drainage outfall at this location.

Restoration Area B: Beach Access Bridge Crossing and Channelized Creek

The wooden and metal bridge structure at the beach access road at Restoration Area B, which crosses the creek approximately 1,000 ft. north of the beach outfall location, has concrete channel lining on each side of the bridge. The concrete bridge protection will remain in place, however, past the location needed for bridge stability, the concrete creek banks and channel bottom will be modified to provide a more natural earthen and cobble creek bed and bank habitat condition. The concrete

protection past these points will be removed and replaced with alternative biodegradable creek bank protection. Accumulated sediment, not currently supporting wetland vegetation, in the channel bottom area will also be removed and replaced with natural boulders, cobble and gravel to create a better substrate. Alternative creek bank stabilization measures including willow wattles, coir logs and coir blankets will be utilized at the transition points from concrete to natural earthen bank, to provide additional erosion control protection and to allow for revegetation of the creek banks. All non-native vegetation will be removed from the immediate creek channel areas and the resultant areas will be revegetated with appropriate native species. Any highly invasive/exotic non-native species within a 20 foot wide buffer zone on either side of the bridge and the creek bank area will be removed and revegetated with appropriate native riparian species.

Restoration Area C: La Casa Grande Bridge Crossing and Degraded Creek Bottom

The La Casa Grande bridge crossing at Restoration Area C, which facilitates vehicular access to the westerly portion of the Dos Pueblos Ranch area, will have the creek area below the bridge modified to help restore more natural creek habitat. The accumulated sediment in the creek bed will be removed and additional boulders, cobble and gravel with be installed to create a more natural creek bed substrate. Better step pool connections will be created both upstream, as well as downstream of the isolated remnant pool which exists under the bridge. Any trout or other aquatic species in the creek pools will be protected and/or will be relocated during the creek bed restoration/modification work. The concrete channel creek bank protection upstream of the bridge will be further evaluated to see if portions of the concrete protection can be removed and replaced with alternative creek bank stabilizations measures including willow wattles, coir logs and blankets. The resultant areas will then be planted with appropriate native riparian species. Downstream from this bridge the non-native shrubs and ground cover species growing in the creek and within the 20 foot buffer zone on each side of the top of the creek banks, will be removed and replanted with appropriate native riparian species. Significant organic debris which has accumulated within the creek bed areas will be removed to help restore a more natural creek bottom.

Restoration Area D: Hwy 101 Bridge and Concrete Drop Structure (Caltrans)

At the Hwy 101 bridge location identified as Restoration Area D, under the eastbound bridge (i.e., southerly bridge crossing), at the location of the old concrete paving and vertical grade control drop structure, the creek channel bottom and creek banks will be modified. Several transitional drop structures and step pools will be created to transition the five foot elevation drop in this location, into a series of terraced one foot vertical drop pools, which will then connect with the pools and natural creek bottom which currently exists downstream of this location. A profile of the step pool design with a 1-foot deep notch in the concrete is shown in Appendix B. The drop structures and step pools will be created utilizing curvilinear concrete walls interlaced with boulders and cobble to help

simulate a more natural creek bed bottom to help facilitate fish passage over this location. The gradient for the new step pools and drop structure will be designed at no greater than 5%. The channel side slope creek banks will be stabilized with alternative creek bank stabilization measures including sloped green gabion structures suitable for planting and willow wattles, coir logs and coir blankets for stability and to help facilitate natural creek bank revegetation.

An alternative to the step pools could be a roughened channel, also constructed at a maximum 5 percent slope gradient. The roughened channel is a ramp of graded material, identified as Engineered Stream Bed Material, according to procedures outlined in the California Salmonid Stream Habitat Restoration Manual, Fourth Edition (Flosi, et al 2010). The material would consist of large boulders, cobbles, gravel and fines designed to create hydraulic diversity and passable conditions for fish.

The final details for the construction of the creek modifications in this location will need to be worked-out in collaboration with Caltrans for any work to be completed within their road easement right of way and for compliance with previous bridge improvements completed in this area. To the degree possible, the center of the old concrete paving which currently carries the creek low flow, will be modified to recreate a more natural four foot wide sloping pilot channel through the concrete paving, to better facilitate fish passage. The pilot channel would be stabilized with boulders, cobble and gravel to provide a better creek bed substrate. The pilot channel would be designed to interface with the proposed step pools downstream from the current drop structure.

4.3 Restoration Area Strategies: Areas North of Hwy 101 (Schulte Property)

Restoration Area E: Agricultural Drain Structure

The old concrete agricultural drainage structure at Restoration Area E, which is located approximately 2,200 ft. upstream from the Hwy 101 bridge crossing, will be modified to function as a bioretention basin to capture agricultural runoff and provide water quality treatment functions. The bioretention basin will be placed on the upstream side of the Dos Pueblos Canyon access road, prior to the culvert crossing under the road. Downstream from the basin the secondary drainage will be improved through the removal of non-native/exotic vegetation and through the revegetation with native riparian species. The existing crossing under the road will be left in place, and or modified as necessary to facilitate adequate flow out of the bio-retention basin. The intent at this location is to capture potential sediment before it reaches the main section of Dos Pueblos Creek, as well as to improve the water quality leaving this side tributary drainage, as well as to provide improved native vegetation in the area.

Restoration Area F: Unpaved Low Water Crossing and Degraded Creek Bottom

The unpaved low water earthen creek crossing at Restoration Area F, which facilitates vehicular access to avocado grove areas to the east of the creek will be eliminated or modified through the installation of an elevated bridge or soft bottom arch culvert crossing. Either a free span bridge structure, or a soft bottom (i.e., earthen) pre-cast concrete arch culvert structure (i.e., such as a 'Conspan' Bridge) will be utilized at this location. Any remnant sediment will be removed from the immediate creek area and additional boulders, cobble and gravel substrate will be reestablished in the immediate creek area. All non-native exotic species within 50 foot radius of this location will be removed and will be revegetated with native riparian species.

Restoration Area G: Unpaved Low Water Crossing and State Water Crossing

The unpaved low water earthen creek crossing at Restoration Area G, which facilitates vehicular access to agricultural areas to the east of the creek will be eliminated or modified through the installation of an elevated bridge or soft bottom arch culvert crossing. Either a free span bridge structure, or a soft bottom (i.e., earthen) pre-cast concrete arch culvert structure (i.e., such as a 'Conspan' bridge structure, or equal) will be utilized at this location. Any remnant sediment will be removed from the immediate creek area and additional boulders, cobble and gravel substrate will be reestablished in the immediate creek area. All non-native exotic species within 50 foot radius of this location will be removed and will be revegetated with native riparian species.

The State Water pipeline crossing at this location will be attached to and will be anchored to the bridge structure. Coordination will be needed with the appropriate water agencies/districts to facilitate this work being done per applicable standards.

Restoration Area **H: Paved Low Water Crossing and Concrete Drop Structure**

The paved concrete low water crossing of the channel at Restoration Area H, which facilitates vehicular access to agricultural areas to the east of the creek will be eliminated or modified. Either a free span bridge structure, or a soft bottom (i.e., earthen) pre-cast concrete arch culvert structure (i.e., such as a 'Conspan' bridge structure, or equal) will be utilized at this location. The concrete creek crossing will be removed. The four foot vertical height concrete grade control drop structure will be modified and a series of drop structures with step pools will be created in this location at a slope of 5% or flatter. The vertical creek bank walls will be removed and sloped banks will be re-established and will be stabilized with sloped green gabion structures suitable for planting and willow wattles, coir logs and coir blankets for stability and natural creek bank revegetation. Boulders, cobble and gravel will be installed within the creek bed areas to re-establish a more natural creek bed substrate suitable for fish passage.

Restoration Area I: Dual Drain Culvert Creek Crossing

The earthen dual drain culvert access road creek crossing at Restoration Area I, which facilitates vehicular access upstream along the east side of the creek, will be eliminated or modified to re-establish a more natural creek bottom crossing. The two corrugated ABS black plastic culvert drain pipes and associated earthen fill will be removed, and the natural creek bottom grade elevations re-established. Ether a free span bridge structure, or a soft bottom (i.e., earthen) pre-cast concrete arch culvert structure (i.e., such as a 'Conspan' bridge structure, or equal) will be utilized at this location. All remnant sediment, both 100 lineal feet upstream and downstream of this crossing, will be removed and natural boulders, cobble and gravel will be installed to re-establish a natural creek bed substrate. The non-native invasive caster bean plants south and west of the crossing, both in the creek and on the channel banks, will be removed. Any resultant bare channel banks following the construction improvements and non-native species removals will be stabilized as necessary and will be revegetated with native riparian species.

Restoration Area J: Abandoned Flood Gate Structure

The old abandoned concrete flood gate dam structure at Restoration Area J, which appears to have been used to retain flow behind this dam/barrier structure and may have had a flood gate that could have been manipulated to control flow, will be demolished and removed. A more natural drop structure will be created utilizing boulders so that the plunge pool below this area can remain. The pool above this location should also remain. The 1.5-foot vertical drop at this location will be minimized through the creation of two 0.75 foot drop step pools. All disturbance areas will be revegetated with native riparian species.

Restoration Area K: Unpaved Low Water Crossing

The unpaved low water earthen crossing of the channel at Restoration Area K that facilitates vehicular access to avocado grove and agricultural areas to the east and north of the creek will be eliminated or modified. Ether a free span bridge structure, or a soft bottom (i.e., earthen) pre-cast concrete arch culvert structure (i.e., such as a 'Conspan' bridge structure, or equal) will be utilized at this location. Any remnant sediment will be removed from the immediate creek area and additional boulders, cobble and gravel substrate will be reestablished in the immediate creek area. All non-native exotic species within 50 foot radius of this location will be removed and will be revegetated with native riparian species.

The non-native eucalyptus trees within a 50 foot radius surrounding this location will be removed and will be revegetated with appropriate riparian species.

Restoration Area L: Agricultural Water Diversion/Weir Structure

The man-made concrete trapezoidal diversion channel at Restoration Area L, which diverts water flow from the main creek, at a natural turn in the creek, and channels the flow to the east around a curve in the canyon to a weir diversion structure, will remain in place but will be modified where possible. The majority of the creek flow is currently diverted seasonally by this structure through two iron water lines that carry water via gravity flow to various locations downstream for agricultural use, but still allows some flow to continue through the creek over the weir and concrete spillway below. Due to previous agricultural water use agreements that have historically been in place and the desire to retain sustainable agricultural resources within the subject properties, this use needs to continue, however the allowable amount of water that can be diverted back into a natural creek system will be re-diverted through creek modifications and reestablishment of a secondary flow drainage to the west of the current creek alignment. The concrete lined spillway and drop structure present below the weir at this location will remain in place. The concrete lined creek bed and bank channel protection also in place downstream of this location, to protect the creek channel from erosion during storm flows, will also remain in place. The concrete lined channel upstream of the weir structure, which is eroded and broken in several locations, will be modified and a boulder, cobble and gravel creek substrate will be reestablished.

At the start of the concrete channel, at the upstream end, the earthen berming and boulders which had been installed to help divert the entire creek flow into the concrete diversion channel, will be removed. The old natural creek drainage alignment that exists to the west of this location (referred to herein as the secondary flow/bypass channel), which joins with the natural creek at the pools below the weir structure, will be re-established. An adjustable flashboard weir will be installed within the existing concrete diversion channel to help redirect some of the flow through the secondary creek drainage, while still allow the desired flow to the weir structure. This devise would be designed to be adjustable by season, based upon the desired flow to each area. A profile of the natural creek and possible design slopes for the secondary flow/bypass channel, is provided in Appendix B.

Where the weir access road crosses the old natural secondary creek drainage, either a free span bridge structure, or an earthen bottom pre-cast concrete arch culvert structure (i.e., such as a 'Conspan' bridge structure, or equal) will be utilized at this location. The secondary flow/bypass channel, will be re-graded to allow for a portion of the creek flow to be re-directed through the old natural secondary creek drainage. This will be facilitated through the creation of a series of small drop structures and step pools to be created to help facilitate fish passage through this area, providing a connection to the more natural northerly sections of the creek. The design gradient for the new restored secondary creek drainage will be approximately 7%. This should allow for fish passage through this reconfigured area. The intended diversion flow through the secondary flow/bypass channel shall be a minimum flow in the winter to help facilitate fish passage.

This will help eliminate the current physical barrier to fish passage past this location. It should be noted that California Newts (salamanders) were observed within the concrete lined channel area above and below the weir structure, so they should be protected and/or relocated during construction so no impacts occur to this species.

To re-establish the secondary flow/bypass channel, a slope greater than 7-percent may be required, pending confirmation from additional topographic survey. This should be further explored in a Stream Simulation design, if an analog or reference site is nearby. If this design slope is steeper than 5%, which is the typical design standard for fish passage, it sometimes requires informed dialogue with ecological regulators for agreement to allow gradients steeper than the recommended percentage. Another consideration is the timing of activation of the secondary flow/ bypass channel. The channel should be designed and managed to route flows during winter migration of salmonids. Attraction flows at the end of the bypass channel, where it joins the main creek, should draw fish into the bypass, as opposed to distraction of their movement to the base of the 16-foot drop structure below the weir. Also, further study on maintenance flows through the weir and how the secondary bypass flow can function in this respect, related to other agricultural demands will need to be considered.

4.4 Restoration Program Goals

The primary goal of this creek restoration and monitoring program is to restore and enhance riparian habitats that can provide increased habitat functions and services compared to the currently degraded conditions. This goal includes restoration of the creek areas area within the creek restoration construction areas, as well as the restoration and enhancement of additional areas outside of the creek restoration construction areas to provide functions and services greater than those provided by the existing site conditions. Secondary goals of the project are to improve the hydrology within the Restoration Areas and to improve the overall habitat values within the project area. The channel bottom, side slopes/banks and a maximum 50-foot-wide (15 m) construction access buffer zone surrounding the creek banks, will be modified where possible and will be revegetated with appropriate riparian species in order to restore and improve the habitat functions and services. Disturbed, ruderal, and otherwise developed portions of the Restoration Areas will be converted to appropriate riparian habitat, in an additional effort to increase habitat functions and services. As a final measure, riparian habitats adjacent to the Restoration Areas will be enhanced through the removal of exotic/invasive tree, shrub and groundcover species, with subsequent planting and seeding of these areas with appropriate riparian species to improve the native cover and diversity of these habitat areas.

4.4.1 Type of Habitat to Be Restored

The proposed restoration effort will help restore existing disturbed habitat areas and non-native vegetated areas to a vegetated riparian cover through restoration activities proposed herein. The creek Restoration Areas plantings will be designed such that the bottom of the creek beds will support

primarily freshwater marsh and emergent wetland species, while the creek bank/side slopes will support a mixture of transitional riparian scrub and tree species. The larger riparian tree species, such as sycamores, cottonwoods and oaks have been purposefully precluded from the creek bed and lower side slopes in order to continue to allow for flood flow conveyance open over time. Some willow and alder species will be utilized in the outer margins and side slopes of these areas to help stabilize the areas and to provide habitat connectivity. Lower growing shrub and herbaceous species will be utilized in the low lying areas. The taller riparian tree species will be utilized along the upper creek bank areas and adjacent buffer zone areas.

A mixture of native grasses, rushes, riparian shrubs, trees and forbs adapted to the periodically moist stream bed conditions and the drier bank/ side slope conditions are proposed in the planting schemes for the restored creek bank and side slopes and the 20- 50 foot (6-15 m) wide construction buffer zone areas (Tables 4–8). The drier species will be located in the upper margins of the transitional slope areas. Wetter species will be located in the lower margins of the creek bank/slope areas and within the creek bed areas where applicable. The planting palettes have been designed to include a composition of species appropriate to the anticipated hydrological functions of the creek and that are known to occur naturally in this type of riparian habitat. The planting palettes include species with different germination responses, varying wetland affinities and growth forms to provide for plant growth under varying conditions that are likely to occur in the creek bed and adjacent creek bank/side slopes and within the maximum 50 foot (15 m) wide buffer zone areas.

The creek revegetation areas will be maintained during a long-term five-year maintenance and monitoring period, and will have minimal non-native/exotic invasive species present by the end of the five-year period. Non-native/exotic invasive species, such as castor bean, giant reed, pampas grass, tree tobacco, acacia, myoporum, fennel, Brazilian pepper, ash, fan palms, eucalyptus, garden nasturtium, cape ivy, hottentot fig, among others as previously identified, will be removed/controlled and there will be less than 5% cover of these perennial exotic plant/weed species present by the end of the five-year maintenance and monitoring program.

Figures 6a through 6l show the restoration area locations. Example photographs of the current conditions within each of the Restoration Areas are included in Figures 7a through 7l.

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Remove Ornamental Trees and Palm in Channel

Remove Giant Reed and Revegetate

Remove Non-Native Species and Revegetate

Railroad Trestle Crossing

AWT

CSW

A

AWT

GRB

GRB

ORN

Non-native

Non-native

Aquaculture

CSW/AWT

Remove Giant Reed and Revegetate

Remove Palm

Remove Non-Native Species and Revegetate

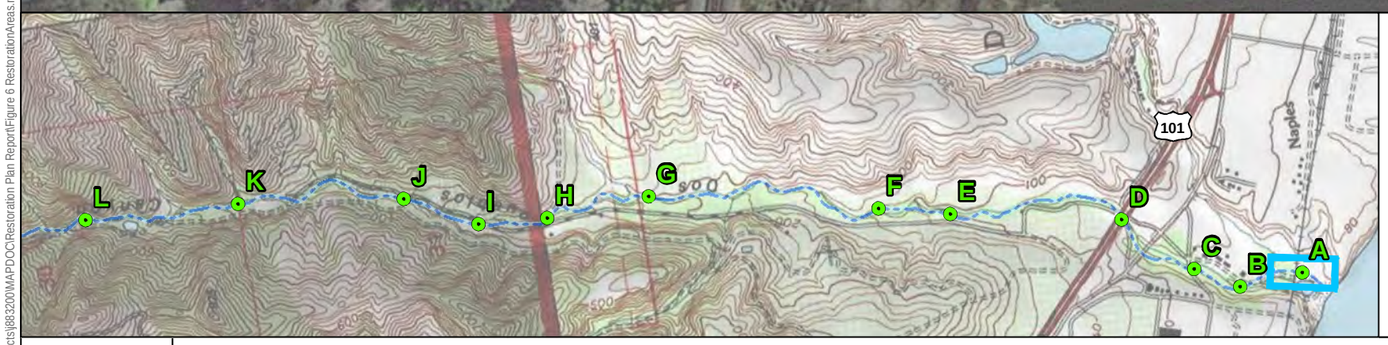
Repair Eroded Creek Bank

OW

Creek Reach Outfall

Pond Water Features

Modify Creek Concrete Channel Outfall



Restoration Area

DP Creek Approximate Centerline

Vegetation Community and Land Cover

AWT - Arroyo willow thickets

CSW - California sycamore woodlands

CSW/AWT - California sycamore woodlands/Arroyo willow thickets

GRB - Giant reed breaks

Non-native

ORN - Parks and ornamental plantings

OW - Open water

DUDEK

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

FIGURE 6a

Restoration Area A - Channelized Creek Area

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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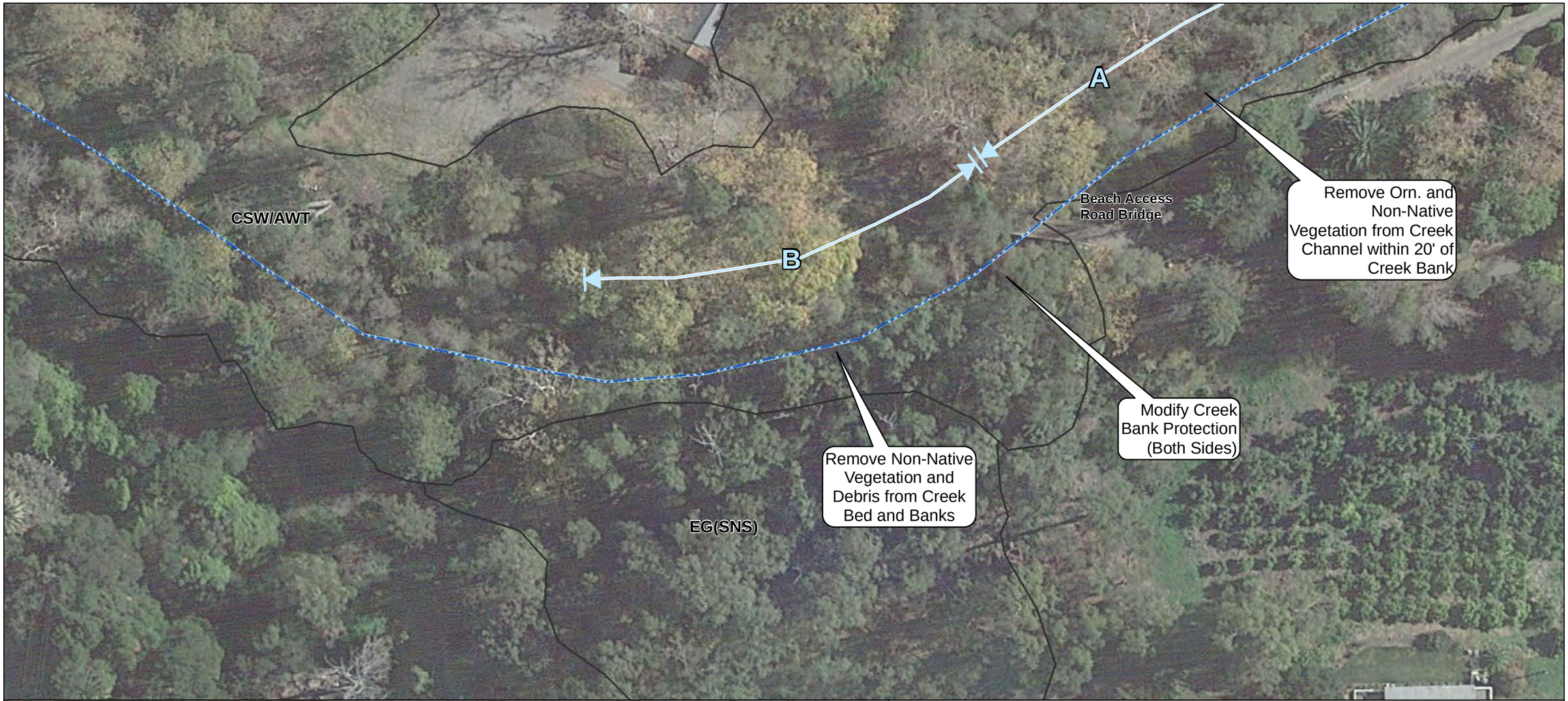

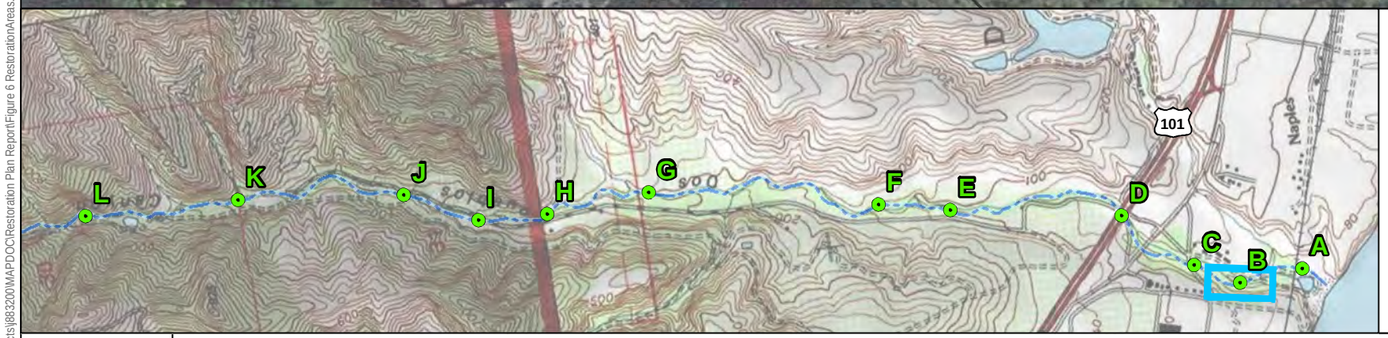

Restoration Area

DP Creek Approximate Centerline

Vegetation Community and Land Cover

CSW/AWT - California sycamore woodlands/Arroyo willow thickets

EG(SNS) - Eucalyptus grove

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

DUDEK

FIGURE 6b

Restoration Area B - Beach Access Bridge & Channelized Creek Area

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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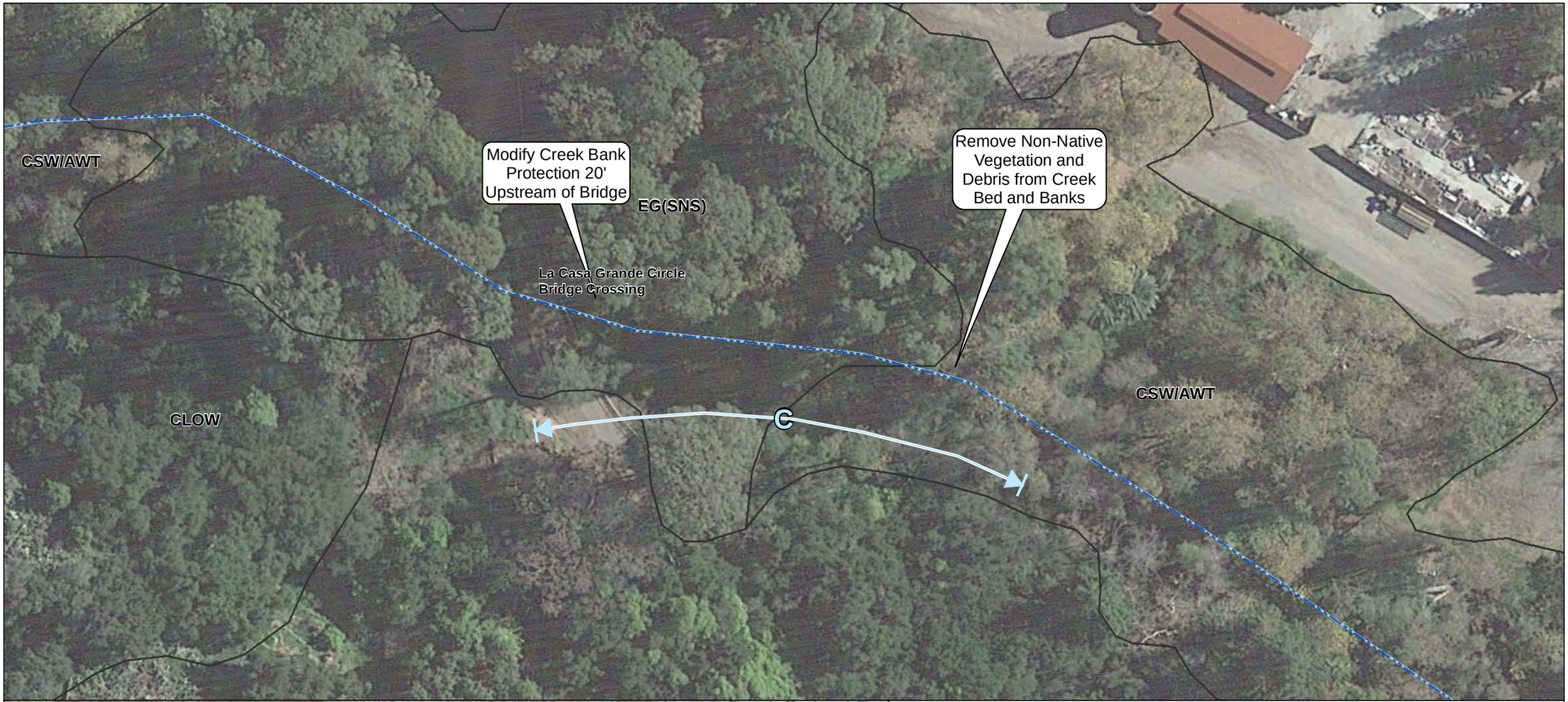

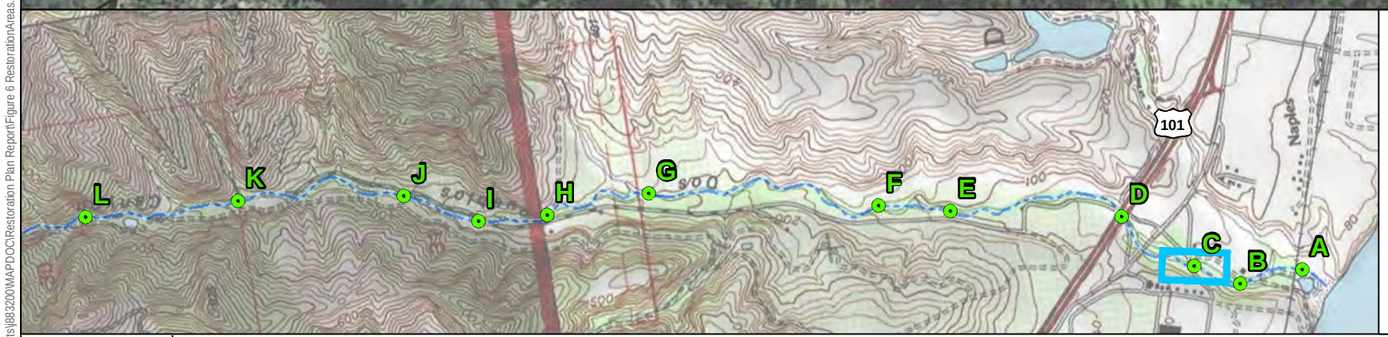

Restoration Area

DP Creek Approximate Centerline

Vegetation Community and Land Cover

CLOW - Coast live oak woodland

CSW/AWT - California sycamore woodlands/Arroyo willow thickets

EG(SNS) - Eucalyptus grove

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

DUDEK

FIGURE 6c

Restoration Area C - La Casa Grande Bridge Crossing and Degraded Creek Bottom Area

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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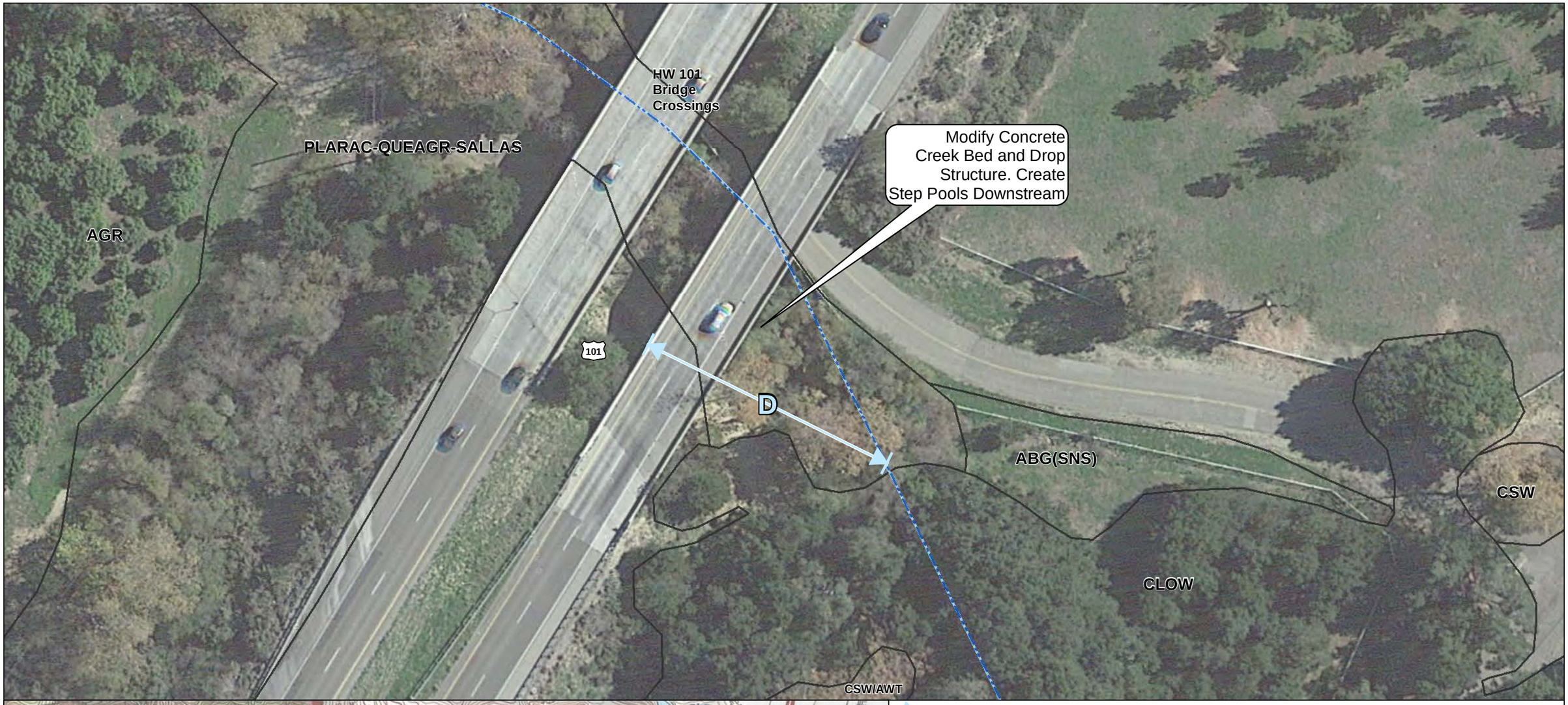

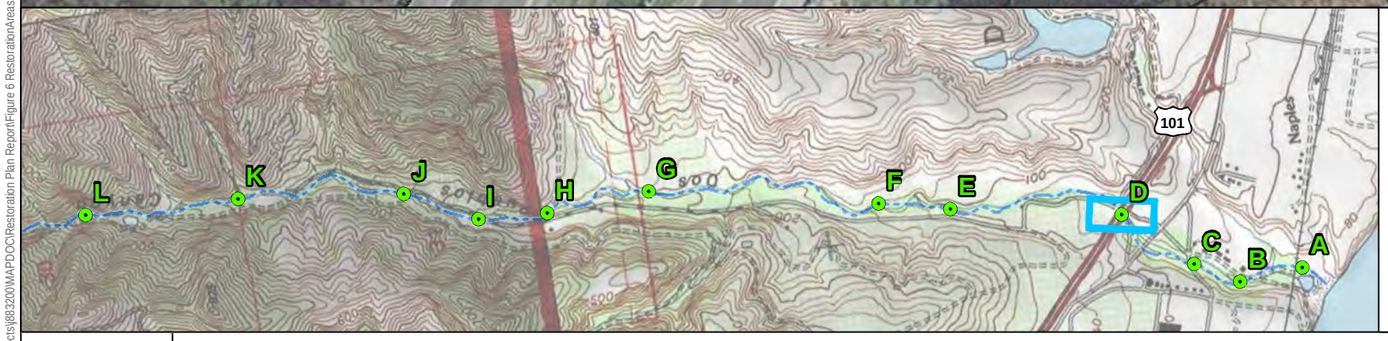

Restoration Area

DP Creek Approximate Centerline

Vegetation Community and Land Cover

ABG(SNS) - Annual brome grassland

AGR - General Agriculture

CLOW - Coast live oak woodland

CSW - California sycamore woodlands

CSW/AWT - California sycamore woodlands/Arroyo willow thickets

PLARAC-QUEAGR-SALLAS - California sycamore-coast live oak-arroyo willow

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

DUDEK

FIGURE 6d

Restoration Area D - HWY101 Bridge Crossing and Concrete Drop Structure

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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AGR

PLARAC-QUEAGR-SALLAS

Remove Non-Native Vegetation in Drainage Downstream of Culvert

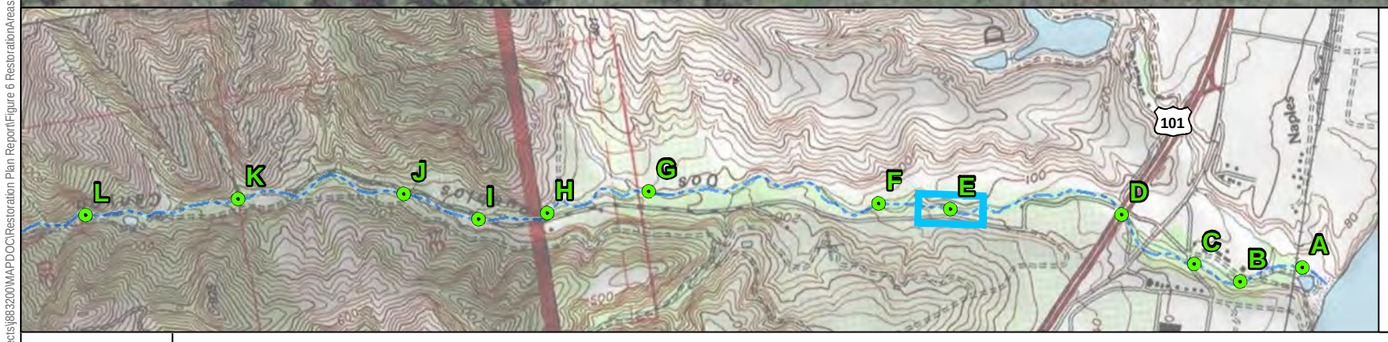
E

AGR

Agricultural Drain Structure/Culvert Road Crossing

AGR

Create Bio-Retention Basin at Upstream Drain Culvert



Restoration Area

DP Creek Approximate Centerline

Vegetation Community and Land Cover

AGR - General Agriculture

PLARAC-QUEAGR - California sycamore-coast live oak

PLARAC-QUEAGR-SALLAS - California sycamore-coast live oak-arroyo willow

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

DUDEK

FIGURE 6e

Restoration Area E - Agricultural Drain Structure

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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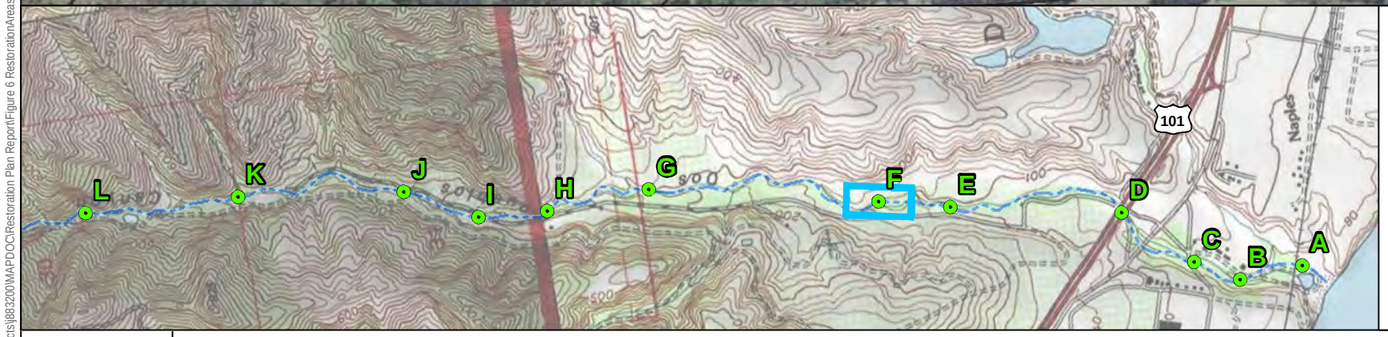

Restoration Area

DP Creek Approximate Centerline

Vegetation Community and Land Cover

AGR - General Agriculture

CSW/AWT - California sycamore woodlands/Arroyo willow thickets

EG(SNS) - Eucalyptus grove

PLARAC-QUEAGR - California sycamore-coast live oak

DUDEK

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

FIGURE 6f

Restoration Area F - Unpaved Low Water Crossing and Degraded Creek Bottom Area

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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CLOW

CLOW

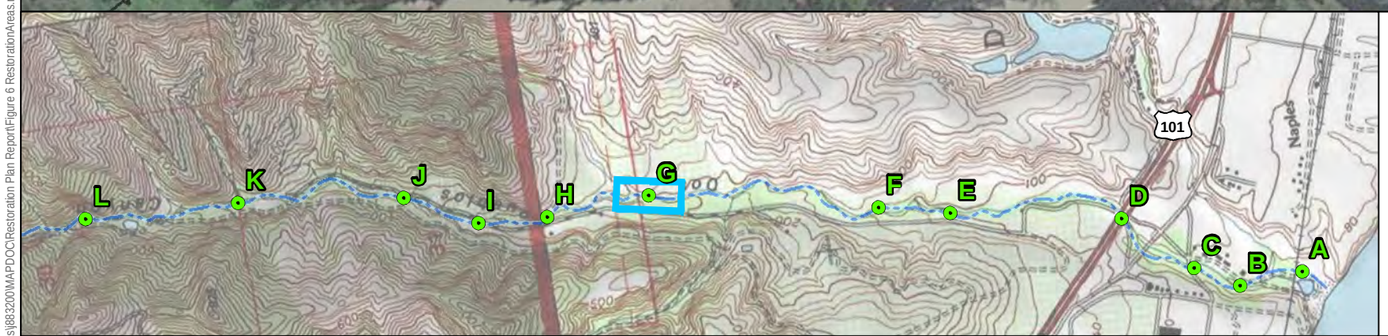
PLARAC-QUEAGR-SALLAS

Unpaved Low Water
Road Crossing
(Agr. Access)

G

Install Free Span
Bridge or Soft Bottom
Culvert Crossing

PLARAC-QUEAGR/BRODIA



Restoration Area

DP Creek Approximate Centerline

Vegetation Community and Land Cover

AGR - General Agriculture

CLOW - Coast live oak woodland

PLARAC-QUEAGR-SALLAS - California sycamore-coast live oak-arroyo willow

PLARAC-QUEAGR/BRODIA - California sycamore-coast live oak/annual brome grassland

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

DUDEK

FIGURE 6g

Restoration Area G - Unpaved Low Water Crossing & State Water Crossing Area

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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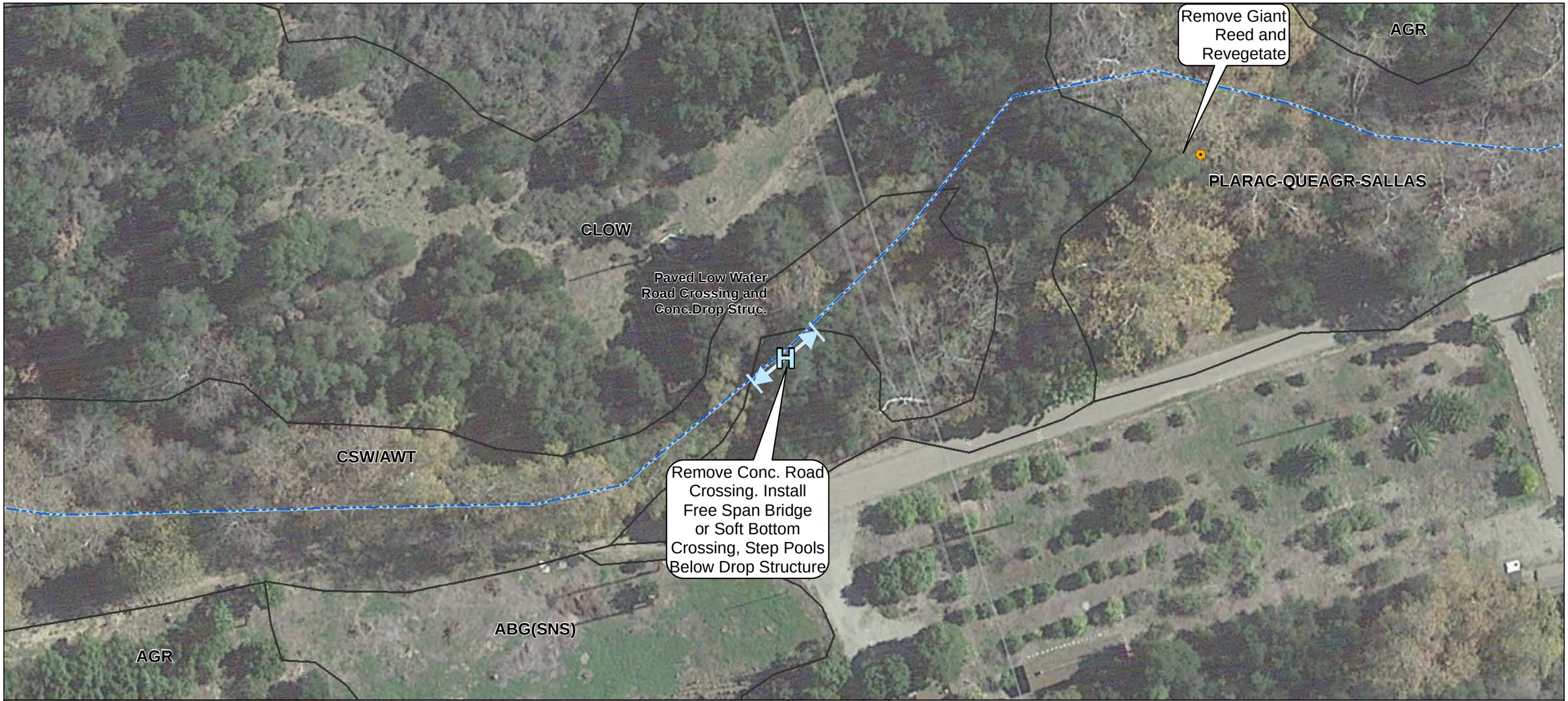

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

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FIGURE 6h

Restoration Area H - Paved Low Water Crossing & Concrete Drop Structure Area

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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AGR

CLOW

AGR

PLARAC-QUEAGR-SALLAS

Remove Castor Bean and Revegetate

PLARAC-QUEAGR-SALLAS

Culverted Creek Crossing

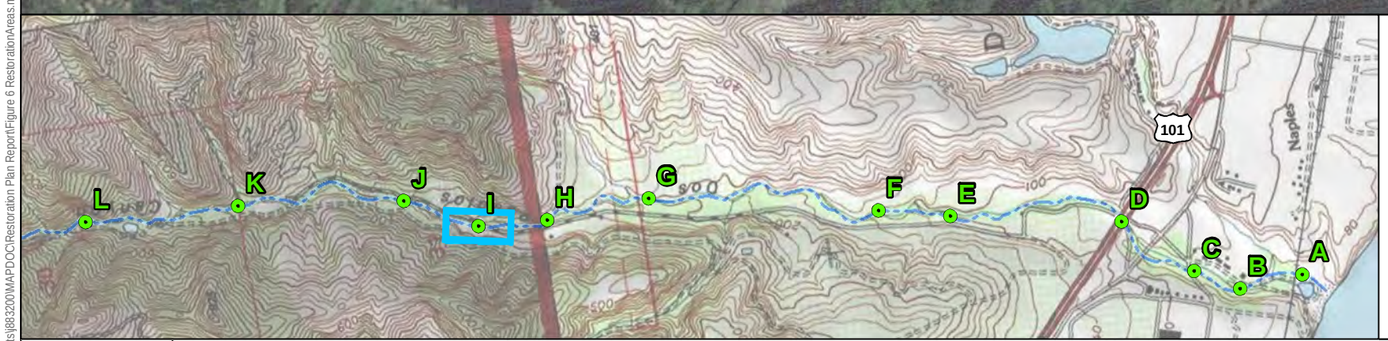
CSW/AWT

DEV

CLOW

AGR

Remove Culverts and Earthen Fill. Install Free Span Bridge or Soft Bottom Culvert Crossing



Restoration Area

DP Creek Approximate Centerline

Vegetation Community and Land Cover

AGR - General Agriculture

CLOW - Coast live oak woodland

CSW/AWT - California sycamore woodlands/Arroyo willow thickets

DEV - Urban/Developed

PLARAC-QUEAGR-SALLAS - California sycamore-coast live oak-arroyo willow

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

DUDEK

FIGURE 6i

Restoration Area I - Culverted Creek Crossing Area

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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Restoration Area

DP Creek Approximate Centerline

Vegetation Community and Land Cover

AGR - General Agriculture

CLOW - Coast live oak woodland

EG(SNS) - Eucalyptus grove

FCF - Fremont cottonwood forest

PLARAC-QUEAGR - California sycamore-coast live oak

PLARAC-QUEAGR-SALLAS - California sycamore-coast live oak-arroyo willow

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

DUDEK

FIGURE 6j

Restoration Area J - Abandoned Flood Gate Structure Area

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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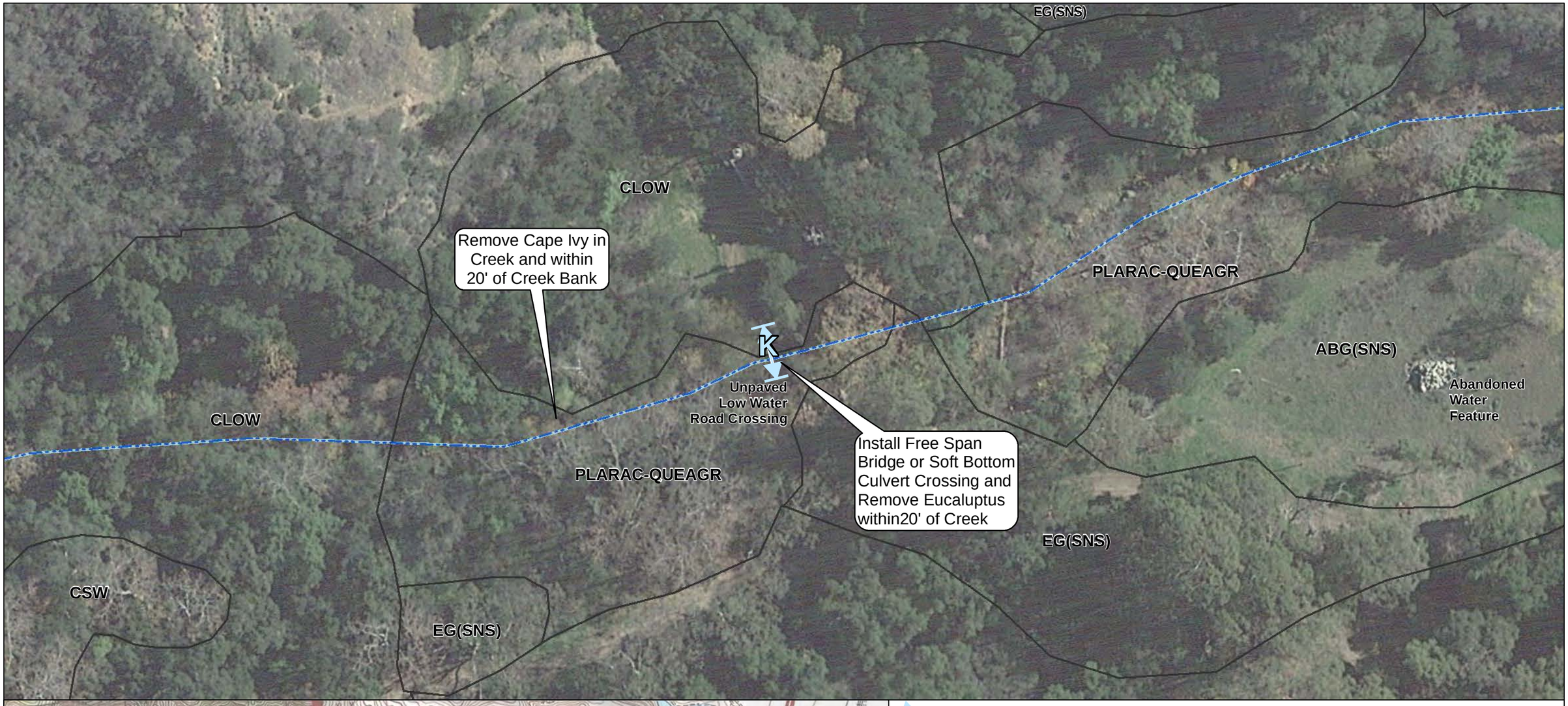

Restoration Area

DP Creek Approximate Centerline

Vegetation Community and Land Cover

ABG(SNS) - Annual brome grassland

CLOW - Coast live oak woodland

CSW - California sycamore woodlands

EG(SNS) - Eucalyptus grove

PLARAC-QUEAGR - California sycamore-coast live oak

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

DUDEK

FIGURE 6k

Restoration Area K - Unpaved Low Water Crossing Area

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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CLOW

Retain Diversion Channel and Weir Structure

Conform on Right Bank

Agricultural Water Diversion Weir Structure

ALNRHO-PLARAC

Possible Flashboard Weir in Concrete Channel for Flow Control

Install Free Span Bridge or Soft Bottom Culvert Crossing at Weir Access Rd Crossing

CLOW

Install Secondary Creek Diversion and Re-Establish Secondary Creek Flow

L

Conform Upstream at End of Concrete Channel

CLOW

Restoration Area

DP Creek Approximate Centerline

Diversion Pipe

Existing Concrete Channel

Existing Weir and Apron

Diversion

Proposed 350' Bypass Channel

Vegetation Community and Land Cover

ALNRHO-PLARAC - White alder-California sycamore

CLOW - Coast live oak woodland

AERIAL SOURCE: Google Maps 2015

0 25 50 100 Feet

DUDEK

FIGURE 6I

Restoration Area L - Agricultural Water Diversion /Weir Structure Area

DOS PUEBLOS CREEK RESTORATION, MAINTENANCE AND MONITORING PLAN

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Photo 1: Beach outfall looking northeast

Photo 2: Concrete channel looking northeast

Photo 3: Creek channel bank protection looking south

Photo 4: Concrete channel exotics giant reed and acacia looking north towards tressle

Photo 5: Giant reed to be removed on creek bank looking east

Photo 6: Palm to be removed on creek bank and willows in creek looking north

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Photo 1: Downstream of beach access road bridge

Photo 2: Upstream of beach access road bridge

Photo 3: Exotic ground cover in creek north of beach access road bridge

Photo 4: Looking upstream at lower creek area

Photo 5: Typical creek condition

Photo 6: Typical creek condition with eucalyptus debris

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Photo 1: Creek conditions downstream of La Casa Grande Bridge

Photo 2: Looking upstream toward La Casa Grande Bridge (eucalyptus debris)

Photo 3: Taking measurement downstream of La Casa Grande Bridge

Photo 4: Underneath La Casa Grande Bridge

Photo 5: Looking into creek at upstream side of La Casa Grande Bridge

Photo 6: Looking upstream from La Casa Grande Bridge

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Photo 1: Hwy 101 bridge concrete paving and drop structure

Photo 2: Old concrete paving under bridge looking south towards drop structure

Photo 3: Looking upstream from old concrete paving

Photo 4: View looking south along creek to old concrete paving under bridge

Photo 5: View looking east at spillway of drop structure

Photo 6: View looking north along lower pool towards spillway of drop structure

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Photo 1: View of agriculture drain structure/culvert on west side of access road (potential bioretention basin location)

Photo 2: View of secondary drainage downstream of agriculture drain structure/culvert

Photo 3: View of agriculture drain structure/culvert on east side of access road

Photo 4: Palm on creek bank to be removed on east side of access road south of agriculture drain

Photo 5: Giant reed on creek bank to be removed on east side of access road south of agriculture drain

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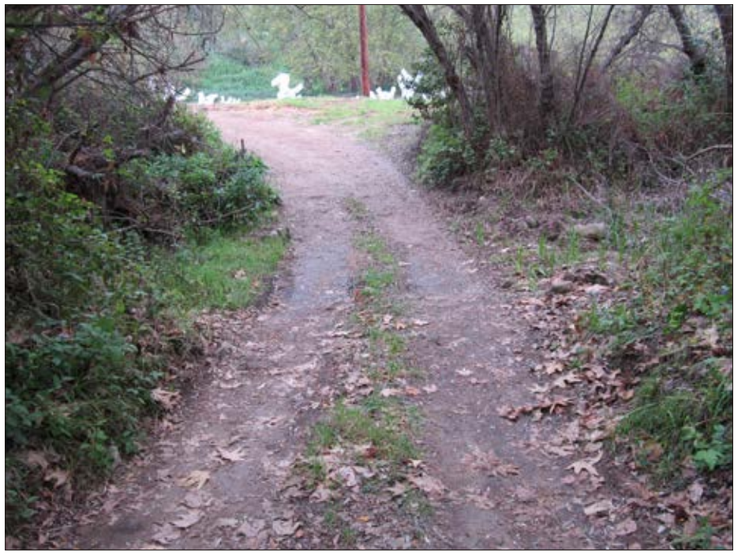

Photo 1: View of unpaved low water crossing looking east

Photo 2: View of unpaved low water crossing looking upstream (north)

Photo 3: View of unpaved low water crossing looking downstream (south)

Photo 4: View of unpaved low water crossing looking west

Photo 5: View of avocado grove southeast side of creek

Photo 6: View of avocado grove northeast side of creek

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Photo 1: View of unpaved low water crossing looking east

Photo 2: View of unpaved low water crossing looking upstream (north)

Photo 3: View of unpaved low water crossing looking downstream (south)

Photo 4: View of unpaved low water crossing looking west

Photo 5: View of unpaved low water crossing looking south at pipe blow off

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Photo 1: View of paved low water crossing looking east

Photo 2: View of paved low water crossing looking south

Photo 3: View of paved low water crossing looking north

Photo 4: View of paved low water crossing & grade control crossing looking north

Photo 5: View of paved low water crossing & grade control crossing looking south

Photo 6: View of paved low water crossing looking west

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Photo 1: View of creek upstream of culvert crossing looking north

Photo 2: View of dual culverts at culvert crossing looking south

Photo 3: View of creek west bank of culvert crossing castor bean removal

Photo 4: View of creek downstream of culvert crossing looking south

Photo 5: View of creek downstream of culvert crossing

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Photo 1: View of old flood gate and wall structure looking northwest

Photo 2: View of pond above old flood gate and wall structure looking north

Photo 3: View of old flood gate and wall structure looking north

Photo 4: Detail view of old flood gate and wall structure looking north

Photo 5: View of pond below old flood gate and wall structure looking south

Photo 6: View of creek downstream of old flood gate and wall structure

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Photo 1: View of low water crossing looking east

Photo 2: View of low water creek crossing

Photo 3: View of low water crossing looking upstream (north)

Photo 4: View of low water crossing looking downstream (south)

Photo 5: View of low water crossing looking west

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Photo 1: View of upstream creek diversion channel

Photo 2: View of upstream end of creek diversion channel at broken wall and start of proposed secondary channel

Photo 3: View of weir structure and pool looking south

Photo 4: View of creek and pools below weir structure looking downstream (south)

Photo 5: View of proposed secondary creek channel below access road (looking northwest from main creek)

Photo 6: View of old creek channel below access road (looking southeast toward main creek)

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4.4.2 Functions and Services of Habitat to be Enhanced

The habitats to be enhanced and revegetated within the creek Restoration Areas are ultimately expected to have higher functions and services than the disturbed areas within the existing areas. A pre-project California Rapid Assessment Method (CRAM) analysis will be performed to evaluate the baseline conditions of the riparian system within each restoration and enhancement area. (Note: See section 5.2 herein) This will be achieved by the removal of non-native/exotic invasive plant species and replacement with native riparian species thereby increasing the riparian area and providing increased diversity of native plant species. This will also provide increased cover and foraging opportunities for wildlife.

Nutrient cycling, sediment and pollutant trapping will also be enhanced by the increased vegetative cover within these areas. Enhancement of the bottom of the creek bed areas will help remove organic matter and debris as well as fine sediments to help improve the geomorphic qualities of the creek bed. In addition, increased riparian vegetation to be established in the adjacent creek bank and buffer zone areas, should help trap sediment and toxicants, thereby improving water quality within the creek. Habitat values will be increased with a more varied and structurally diverse vegetated creek bed and creek bank/side slope area, than previously existed and will provide increased cover and foraging opportunities for wildlife over time. The potential for increased retention of water on site and improved overall flood flow conveyance should help enhance the overall site conditions and provide increased habitat for riparian plant and wildlife species.

4.5 Restoration Cost Projections

An estimate for the initial cost of installation and initial maintenance of the creek restoration effort, will be prepared at the time of preparation of the final revegetation construction documents (i.e., plans, details and specifications). The cost estimate will include all demolition, construction elements, finish grading of planting areas, weed control, exotic tree removal, site preparation, irrigation, container plant installation, hydro-seeding and plant establishment maintenance for the first 120 days following installation.

Long-term maintenance and biological monitoring costs for the proposed five-year maintenance and monitoring period, will also be worked-out once the final acreages for the various restoration areas are established based upon the final revegetation construction documents. The maintenance and monitoring costs will include the costs associated with the weed control, yearly site maintenance, bi-annual biological monitoring, and preparation of annual year-end monitoring reports.

The responsible party will also establish an endowment to cover long term maintenance and management of the creek restoration areas in perpetuity, as further outlined in Section 9.2.

4.6 Target Functions and Services

The long-term goal of the Project is to restore and enhance riparian habitats that can provide increased habitat functions and services compared to the currently degraded conditions. The Project will ultimately increase the quality of the existing site conditions by reducing weedy non-native/exotic vegetation, removing impediments for rainbow trout/southern steelhead and other fish species passage, improving creek water flow during critical fish spawning periods, removing vegetation and/or sediment aggradation causes, increasing native riparian vegetative cover, and improving the overall geomorphic conditions within the creek.

A baseline functional assessment and a forecast functional assessment will be conducted using CRAM to ensure that there will be no net loss of functions and services. The goal is to improve the functions and services of the proposed Restoration Areas to the maximum extent practical in light of existing and future constraints. The post project functions and services must result in an overall average level equal to or better than the existing conditions. Specific target values (or success criteria) for ecological functions and services, as measured by CRAM, are included in Section 7.1.

4.6.1 Target Geomorphic Regime

For restoration of Reach 1, a general mode of pool and riffle structures is suggested, per Montgomery and Buffington (1997). The slope of restored sites in this reach can vary from 1 to 3%. Within Reach 2, restoration can resemble pool riffle to step pool morphology, per Montgomery and Buffington (1997). Bed slopes can vary from 2 to 5%.

Bankfull width in the downstream Reach 1 is most likely about 20 feet (6 m) and bankfull depth is likely around 2.5 to 3 feet (0.8 – 0.9 m). Upstream at the weir the bankfull dimensions for Reach 2 likely decrease to a 15-foot (4.5 m) width and a 2 to 2.5 foot (0.6 – 0.8 m) depth. Restoration design for structures and channel geometry in these reaches should use these dimensions as guides for geometry.

4.6.2 Target Aquatic Regime

The achievable target aquatic regime for Dos Pueblos Creek is largely dependent on the level of stream and watershed restoration and the resulting reduction in the primary stressors to the aquatic system. Based on information obtained during the site assessment, sedimentation/siltation issues, man-made barriers to upstream movement of fish, concrete channels, reduced streamflow, some land management practices (e.g., agriculture), and invasive/non-native vegetation within the riparian zone appear to be the major stressors cumulatively affecting Dos Pueblos Creek. Although all of these factors contribute to the currently degraded conditions within the project reach; the presence of abundant fine sediment throughout much of the project reach (and apparently in upstream areas too) and the lack of adequate

streamflow resulting from the drought conditions, especially during the winter months, coupled with agricultural water use diversion, are the primary stressors currently affecting aquatic habitat and species within Dos Pueblos Creek. This conclusion is supported by the limited availability of clean cobble and gravel substrates for BMIs within the reach, and the apparent low diversity and abundance of aquatic insects observed in several representative locations within the reach.

Since fine sediment is the primary stressor affecting the existing aquatic regime, the target aquatic regime should be focused on reducing the input of fine sediment into Dos Pueblos Creek to allow the system to achieve a new equilibrium associated with less fine sediment. Based on the relatively high amount of fine sediment that currently exists in the creek, any reduction in the amount and distribution of fine sediment within the reach will likely result in additional spawning habitat, and an improvement of habitat for the BMI and periphyton communities. Reductions in the amount of fine sediment within the reach will also benefit rainbow trout/southern steelhead by providing additional and cleaner substrates for spawning, reducing the potential for suffocation of eggs, providing additional cover habitat that was once occupied by sediment, creating additional habitat for BMIs and increasing food resources for all life stages, and returning pools to maximum depths.

Consequently, the target aquatic regime within Dos Pueblos Creek should consist of a mixture of stream habitats with appropriate substrate types (bedrock, boulder, cobble, gravel, and sand), and a target level of around 5% silts and clay (fine sediment) for all habitat types combined. Following a reduction in the amount of fine sediment within the reach along with an improvement in overall habitat conditions, the abundance and diversity of the BMI and periphyton communities should increase relatively rapidly providing more abundant food resources to support a more robust rainbow trout/southern steelhead population in the creek. Reductions in the amount of fine sediment in the system will also reduce the amount of vegetation growing in the channel and allow for more unobstructed flow, which will also increase mobilization of fine sediment and help move this material out of the system during high outflow periods. Additionally, these habitat improvements, including the removal of barriers to upstream migration and increased stream flows, especially during the critical winter months, will also provide the necessary habitat conditions to potentially support the re-establishment of southern steelhead within Dos Pueblos Creek. The intended diversion flow through the secondary flow/bypass channel, at the upper creek channel diversion/weir structure location, will be a designed to carry an appropriate minimum flow in the winter period, in order to help facilitate fish passage.

The target aquatic regime should also contain large woody debris which will also improve aquatic habitat conditions by increasing habitat complexity and the amount of cover habitat for fish. The installation of large woody debris in locations where deeper pools, step-pools, and runs occur, especially in areas where habitat complexity is low, will provide the maximum amount of cover habitat. The combined effect of reducing fine sediment in the system (which will improve and

expand BMI and periphyton communities), improving upstream passage for fish, and providing additional complex cover habitat for rainbow trout will provide the basis for restoring stream habitats and the functioning of associated biological communities.

4.7 Rationale for Expecting Success

It is expected that the proposed Project will have a high probability of success. All proposed creek restoration and enhancement activities will occur within the creek bed and bank areas and will be in proximity to the available water sources. The available water sources and temporary irrigation systems should provide sufficient moisture to sustain the proposed native riparian vegetation (see Plant Palettes Section 5.5.1) to become adequately established. The riparian vegetation communities are anticipated to be able to establish root growth down to the available water table to sustain growth over the long-term. For the upland transitional areas, temporary irrigation will be utilized for approximately three years after planting in order to supplement the available groundwater and to ensure adequate plant survival and establishment.

Natural regeneration of native plants within the Restoration Areas is anticipated to supplement the container plantings and seeding proposed by this Restoration Plan. The result coupled with adequate maintenance should help establish a relatively weed and exotics free riparian area, that should be sustainable and be able to resist non-native weed and exotic plant invasion over the long-term. Container plant and seed materials sources will be used from the coastal Santa Barbara County region, within 25 miles of the Project, thus helping to preserve genetic integrity and increasing the potential for long-term success and sustainability.

5 IMPLEMENTATION PROGRAM AND WORK PLAN

The implementation program outlined herein is contingent upon the approval of this Restoration Plan and the final grading and restoration construction documents by the County and the appropriate resource agencies, including ACOE, CDFW, RWQCB and CC. The following restoration program describes the necessary implementation measures for restoring and enhancing the creek in the designated areas into the desired habitat types.

5.1 Preliminary Implementation Schedule

Table 3 shows the anticipated implementation schedule for the associated restoration activities. These activities are further described throughout Section 5.0.

Table 3
Preliminary Implementation Schedule

Implementation Tasks	Schedule
Order Seed and Container Plants	Upon the hiring of a landscape contractor.
Restoration Area Grading/Trenching/Removal of Structures, Debris, Fill	Upon certification of final grading and restoration construction documents. Based upon final construction phasing strategy.
Top Soil Salvage	To be done concurrently with grading activities.
Non-native Tree Removal	To be done after concurrently with removal of concrete aprons.
Restoration Area Finish Grading	To be completed after all grading/trenching/removal activities are completed. Salvaged top soil will be placed and finish grading completed.
Irrigation Installation	To be installed after fine grading is completed and prior to initial weed treatment. Discontinued by the end of Year 3 and removed/abandoned at the end of Year 5.
Restoration Site Clearing and Grading	To be done after non-native trees are removed.
"Grow and Kill" Weed Treatment and Initial Weed Treatment	Upon completion of grading and installation of irrigation system. Site will be irrigated to promote weed germination and all germinating weeds will be controlled by hand and by herbicide.
Container Planting	Following weed eradication and container planting.
Hydroseed Application	Following weed eradication and container planting.
Establishment Period: Assessment of installation, seed germination, and plant establishment.	Monthly during initial 120-day period following hydroseeding and container plant installation.
Site Maintenance	Five years. Quarterly during Year 1 and on an as-needed basis during Years 2–5, based on biological monitoring and Biologist's recommendations.
Biological Monitoring	Qualitative monitoring quarterly during Year 1, beginning with successful completion of initial maintenance period, and bi-annual during Years 2–5. Quantitative Monitoring (transects) in Years 3–5.
Final Sign-Off	End of Year 5 (or earlier if agreed to by agencies, based upon achievement of Year 5 standards)

5.2 Existing Resources Protection

The limits of the workspace within the restoration and enhancement areas will be clearly marked with flagging or similar means (i.e., barriers, staking, etc.) to ensure that all mechanized equipment does not enter preserved riparian habitats. These areas will be clearly designated on the final grading and restoration construction documents. Prior to the initiation of construction, a qualified biological monitor will be hired to be on site during vegetation clearing, project grading and construction in order to ensure compliance with all requirements of any resource agency permits. The biological monitor will document compliance with the resource agency permits.

Existing resource protection will be the responsibility of the General Contractor during grading, trenching, or removal of debris or fill activities. The Landscape Contractor will be responsible for existing resource protection during site preparation, weed eradication, soil amending, finish grading, irrigation system installation, container plant installation, hydroseed applications, and initial 120-day plant establishment maintenance.

5.2.1 Water Quality Protection

Impacts to water quality from construction of the Project, namely removal of concrete slabs, culverts, and installation of bridges in place of Arizona crossings, will be minimized by implementation of BMPs, which will help control erosion and sediment runoff/deposition downstream. Measures to avoid and/or mitigate impacts to water quality will be incorporated into the final grading and restoration construction documents, and will include the following:

- All construction practices will be in compliance with RWQCB requirements. Final measures will be defined on the final grading and restoration construction documents.
- Implementation of BMPs will be defined on the final grading and restoration construction documents.
- Construction activities will abide by time of year restrictions and the environmental resource agencies (ACOE, CDFW, and RWQCB) permits and conditions.
- Construction staging areas will be located in upland areas away from all wetland resources and not adjacent to creeks or drainages. All equipment maintenance work will occur within designated staging areas, outside of all drainages.
- All contractors will conduct vehicle maintenance, staging, storage, and refueling activities within upland staging /assembly areas, a minimum of 50 feet from riparian and/or open water areas, where spills cannot enter waters of the U.S., including gutters and storm drains. No debris, soil, silt, sand, sawdust, rubbish, cement, or concrete washings thereof, and oil or petroleum products, from construction will be allowed to enter into, or be placed where it

may be washed by rainfall or runoff into, waters of the U.S. All contractors will employ all appropriate Best Management Practices (BMP's) to ensure that toxic materials, silt, debris, or excessive erosion do not enter waters of the U.S. during project construction.

- All construction vehicles will be adequately maintained and equipped to minimize/eliminate fuel and or lubricant spillage within the riparian areas.
- Upon completion of construction activities, any excess materials or debris will be removed from the work areas and disposed of properly in an appropriate off-site location.
- Periodic watering of areas during construction/grading activities to control dust.
- Prompt restoration of graded creek channel areas, disturbed areas and surrounding slope areas, will occur as soon as possible following grading/trenching/removal activities to prevent erosion and to stabilize the slope surfaces against erosion.

5.2.2 Aquatic Resource Protection

Based on available information pertaining to Dos Pueblos Creek and the results of the two-day site assessment, the primary issues affecting aquatic habitat in Dos Pueblos Creek within and upstream of the project reach appear to be: 1) significant sedimentation/siltation issues and associated impacts on the condition and quality of available habitat, BMI and periphyton communities, and rainbow trout spawning and juvenile rearing habitat; 2) man-made barriers to upstream (and potentially downstream) movement of fish; 3) limited complex habitat and cover for fish; 4) concrete channelization of sections of the creek; 5) reduced streamflow due to drought conditions and diversion for agricultural use; and 6) invasive vegetation within and adjacent to the channel. Additionally, some land management practices (e.g., agriculture) adjacent to the creek may also have a negative effect on Dos Pueblos Creek. In addition to the individual effects of each of the above aquatic resource issues on the amount and quality of aquatic habitats in the creek, the resulting cumulative effect of these factors appears to be having a substantial negative effect on all aquatic communities and aquatic functions.

Since BMIs and periphyton typically comprise the basis of the food web in all stream systems, providing support for all aquatic functions and species within the ecosystem, improving the function and condition of aquatic resources within Dos Pueblos Creek will be largely dependent on the level of reduction in fine sediment to the creek.

In most lotic systems, the presence of significant amounts of fine sediment is generally correlated with degraded habitat conditions. Fine sediments degrade streams by filling interstitial cracks between available substrates; filling pools (reducing pool depths) and accumulating in eddies behind obstructions (bedrock, boulders, etc.) in the creek reducing habitat for rainbow trout; depositing a thin

layer of sediment over boulder, cobble, and gravel surfaces in slow water conditions, effectively eliminating or reducing available habitat for all life stages of rainbow trout, and BMIs and periphyton.

Thick accumulations of fine sediments (which occurs in numerous locations within and upstream of the project reach) has created relatively sterile areas that either lack aquatic species or have low abundance and diversity of aquatic species. Unless these accumulations are periodically flushed downstream and redistributed during higher flows, they typically result in the formation of anoxic sediments (as observed downstream of the La Casa Grande bridge crossing and in several locations upstream of the Highway 101 bridge crossing).

Observations obtained during the field visits to the proposed restoration sites identified by Impact Sciences (2010), indicated that fine sediment was widely distributed throughout the reach occurring in varying percentages relative to larger substrates. In most of the lower gradient, depositional sections of the creek (from the mouth upstream to just below the abandoned flood gate), fines appeared to be fairly evenly distributed in low energy habitats (pools, step-pools, and some runs), although main channel pools (except for plunge pools) generally contained the deepest sediments. Additionally, in areas with slow water movement, a thin layer of sediment often covered most rock surfaces. Very few aquatic insects can survive on rock surfaces covered by even a thin layer of fines. With increased stream gradient, which occurs from the abandoned flood gate structure upstream to above the weir and associated concrete channel, the distribution of fine sediment is relatively patchy occurring primarily in pools and step-pools, and in pockets downstream of some bedrock and boulders; with less rock substrate covered with a thin layer of sediment. BMIs appeared to be slightly more diverse than in downstream areas but numbers still seemed low, although the low numbers could also be associated with the time of year, since aquatic insect populations are typically depressed during the winter months. The presence of relatively high amounts of fine sediment within the Dos Pueblos Creek channel can also negatively affect rainbow trout spawning by covering spawning gravels and suffocating eggs, degrading habitat used for rearing by larval and juvenile rainbow trout, and diminishing available food resources.

In addition to the above aquatic issues, the presence of man-made barriers to fish movement and general paucity of complex habitat and cover for fish (along with the apparent limited food resources) is likely restricting the distribution and expansion of the rainbow trout population within the reach. The removal of all man-made barriers to upstream fish movement and installation of large woody debris to increase habitat complexity and cover for fish will help return the stream channel and the associated aquatic community to pre-existing conditions. Additionally, the removal and/or restoration of concrete-lined portions of the stream channel and degraded stream crossings will also improve overall stream conditions and aquatic habitat. Increased streamflow, particularly during the critical winter months, and less diversion for agricultural purposes will also help improve the overall stream conditions and aquatic habitat. However, the relatively high percentages of fine sediment

persisting within the drainage are compromising the quality of the aquatic habitat. Removal of fine sediment where possible will help improve the habitat conditions.

5.2.3 Agricultural Water Diversion

The effect of the agricultural diversion of water from the creek needs to be explored further to determine the minimum amount of water needed for agricultural sustainability, and how much water can be redirected into the creek seasonally, particularly during the critical winter months, to help improve the overall aquatic habitat and to help support fish passage through the creek. Management measures will need to be adopted to help strike a balance between these two competing water demands. The intended diversion flow through the secondary flow/bypass channel at the far north end of the creek, in the vicinity of the concrete bypass channel/ weir location, shall be a designed to receive a minimum flow in the winter to help facilitate fish passage.

5.2.4 Sensitive Species Protection

In order to avoid potential direct and/or indirect impacts to special-status species, including migratory nesting birds, time of year restrictions will be imposed on initial construction activities and restoration activities over the five year maintenance and monitoring period.

The following post-construction maintenance and monitoring activities can occur without time of year restrictions because they are considered passive and non-impactive to nesting birds:

- Backpack herbicide application sprayers
- Trash and debris removal by hand
- Non-native vegetation removal using hand-operated, non-motorized tools (i.e., trimmers, hoes, shovels, pruners, machetes, etc.)
- Hand application of seed mix

To avoid and/or minimize impacts to nesting birds, the following post-construction maintenance and monitoring activities will be discouraged during the nesting bird season (i.e., March 15-September 15):

- Use of noise-generating motorized equipment and tools to remove non-native vegetation
- Truck-based herbicide application
- Truck-based hydroseed application

However, these activities may occur during this time provided a qualified biologist conducts a survey for nesting birds within 48 hours prior to performing these activities in the area, and ensures no nesting birds or their nests will be affected by this work.

Oak trees, because they are particularly sensitive to environmental conditions, will be protected. All activities done in the proposed Restoration Areas will be carried out with direction from the Project Biologist in such a manner as to avoid damage to native oak trees.

5.2.5 Cultural Resource Protection

In the event of any discoveries during construction of either human remains, archaeological deposits, or any other type of historic property, procedures identified in the Cultural Resource Program Plan will be implemented and followed by the Construction Manager and/or Biological or Archaeological monitor present on site.

The Cultural Resource Program Plan (CRPP) will: (i) be prepared by a County-approved archaeologist; and (ii) be submitted to and approved by the County prior issuance of any permit or the granting of zoning clearance for any aspect of the Project. Project development is likely to occur at different times and by different parties. As a result, it is essential that all cultural resource investigations regardless of location and applicant be compatible in order to ensure that data are recovered, analyzed, and reported consistently. Therefore, the CRPP will be comprehensive in scope and design and will be used to guide all investigations regardless of location or time. As noted above, the CRPP will provide an overall framework (prepared at the onset of project development) that would be refined as needed to plan and conduct site-specific investigations in different parts of the Project area (e.g., in different lots).

5.3 Construction Modifications and Grading

The General Contractor will be responsible for any grading, trenching or debris removal activities associated with the Project. Final grading plans for the Project will be prepared and approved by the County and will be implemented by the selected General Contractor. The responsible party will acquire all necessary grading permit(s), resource agency permit approvals and County approvals prior to beginning work.

5.4 Site Preparations

The Landscape Contractor will be responsible for site preparation, exotic species and weed eradication, soil amending, finish grading, irrigation system installation, container plant installation, hydroseed applications, and initial 120-day plant establishment maintenance, as specified in this Restoration Plan, and/or as modified in consultation with the Biological Monitor.

5.4.1 Topsoil Salvage

In areas where grading will occur and native vegetation and native soils exist, topsoil salvage will occur. Topsoil will be salvaged, stored, and utilized to help establish the final finish grade of any Restoration Areas where temporary impacts are proposed to occur, and where native topsoil could benefit the establishment of the targeted vegetation community.

For upland transition areas(i.e., coyote brush scrub), the top 6 inches (inches 0–6) of topsoil will be removed and stockpiled on site in a designated staging area. For grasslands soil (i.e., ABG), the top 2 inches (inches 0–2) will be stripped and disposed of off-site to remove the non-native seed bank. Six inches below that (inches 2–8), soil will be salvaged and stockpiled on site in a separate designated staging area. These soils will be installed where practical and feasible over the areas to be restored.

After any grading/trenching/removal activities associated with the Project, salvaged topsoil will be finish graded by the landscape contractor to provide an overall uniform planting surface and to establish the finish grade for planting.

5.4.2 Initial Exotic Species Removals

A temporary irrigation system (see Section 5.4.3) will be installed to provide supplemental irrigation to the native seed and container plants to help foster plant establishment. Prior to the installation of native seed and container plants, a "grow and kill" cycle of weed eradication will be conducted by the Landscape Contractor, by activating the irrigation system over an approximate two-week period to encourage non-native seedling emergence. When weeds have begun to grow, a foliar application of an appropriate systemic herbicide will be applied to kill the weeds. Any herbicide application will be conducted in accordance with label instructions under the direction of a state-certified Qualified Pesticide Applicator, under guidance provided by a Certified Pest Control Advisor. The "grow and kill" cycle will be repeated at least twice to help successfully control the weeds.

5.4.3 Temporary Irrigation System

A temporary irrigation system is proposed to provide supplemental irrigation to the upland or slope Restoration Areas to ensure native container plants and seed installed at the site become adequately established and to provide irrigation for initial exotics species removal and treatment (see Section 5.4.2).

The irrigation system will be installed as an above-ground system, so that irrigation equipment may be removed once the system has been decommissioned and the site has been signed-off. The irrigation system will utilize a water source located as close to the site as possible. All on-site irrigation will consist of PVC pipe staked on grade at approximately 10 feet on-center and at all corners, providing 100% coverage of the Restoration Areas using spray and/or rotor heads where

appropriate. Check valves will be installed to eliminate low-head drainage where necessary. All irrigation will be installed and maintained by the Landscape Contractor.

The irrigation system will only be used until the plants are established such that they can survive on their own from the natural water sources and seasonal rainfall. It is expected that the irrigation system will be shut-off/abandoned at the end of year three of the five-year maintenance and monitoring period, depending upon the level of plant establishment achieved. Watering on site will gradually be decreased prior to the irrigation system being abandoned to allow the plants to become acclimated to the site's natural hydrology.

5.4.4 Erosion Control and Best Management Practices

Applicable erosion control measures in the form of best management practices (BMPs) will be used during Restoration Area preparation and installation to minimize erosion and topsoil loss, as site conditions necessitate. BMPs will be maintained throughout Restoration Area construction and during the 5-year maintenance and monitoring period or until new native vegetation is sufficiently established to provide adequate stabilization and erosion protection. BMPs will be implemented throughout the Restoration Areas in quantities and design as necessitated by grade and site conditions, and as specified in the approved final grading and restoration construction documents. The Project Biologist will monitor BMPs during scheduled monitoring visits to help ensure BMP maintenance. BMPs include installation (as necessary) of an erosion control seed mix and/or bonded fiber matrix, silt fencing, fiber rolls, and gravel bags at key locations where there is potential for soil erosion or sediment transport.

5.5 Restoration Planting Design

Restoration of specific vegetation communities, as discussed in Section 4.1, will be accomplished through a combination of container plant installation and native seed application, as indicated herein. Plant materials for the various habitat types in Restoration Areas A – L will include container-grown stock and native seed mixes, as indicated in Tables 4–8.

All restoration installation and maintenance work will be performed by a qualified Landscape Contractor and monitored by the Project Biologist for compliance with the final restoration construction documents, the intent of this Restoration Plan and per the resource agency permit requirements.

5.5.1 Recommended Plant Palettes by Vegetation Community

Table 4
Riparian Woodland Vegetation Communities
Applicable to Restoration Areas A, C, F, I, J, K

Botanical Name	Common Name	Wetland Status	Size (gallons)	Approximate Spacing (feet) (on center)
Alnus rhombifolia	white alder	FAC	1	~12
Baccharis salicifolia	mulefat	FAC	1	~8’
Platanus racemosa	western sycamore	FAC	1	~25’
Populus fremontii	Freemont cottonwood	UPL	5	~12
Rosa californica	California rose	FAC	1	~6 (groupings of 6)
Salix exigua	narrow-leaved willow	FACW	1	~10
Salix goodingii	black willow	FACW	1	~12
Salix lasiolepis	arroyo willow	FACW	1	~10
Umbellularia californica var. *californica*	California bay laurel	UPL	1	~8

Table 5
Riparian Woodland and Mulefat Willow Thicket Seed Mix Plant Palette

Botanical Name	Common Name	Lbs/Acre
Artemisia douglasiana	mugwort	6
Baccharis salicifolia	mulefat	10
Clematis pauciflora	rope-vine clematis	1
Elymus condensatus	giant wild rye	3
Pluchea sericea	arrow weed	4
Verbena lasiostachys	western verbena	2
	Total	**26 lbs/acre**

Hydroseed Slurry:
Seeds as indicated above per mix.
2,500 pounds/acre virgin wood fiber mulch.
Ecology Controls M-Binder/seed tackifier, or approved equal, at 80 pounds/acre (for installation on slopes from November through March).
Fertilizer 11-55-0 at 200 pounds/acre.

Table 6
Mulefat Thicket Vegetation Communities
Applicable to Transitional Riparian Restoration in Restoration Areas A, B, C, F, K

Botanical Name	Common Name	Wetland Status	Size (gallons)	Approximate Spacing (feet on center)
Artemisia douglasiana	Douglas mugwort	FAC	1	~3 (groupings of 5)
Baccharis salicifolia	mulefat	FAC	1	~8
Isocoma menziesii	Menzies' goldenbush	FAC		
Elymus condensatus	giant wild rye	UPL	1	~3 (groupings of 10)
Malosma laurina	laurel sumac	UPL	1	
Rosa californica	California wild rose	FAC	1	~6 (groupings of 6)
Rubus ursinus	California blackberry	FACU	1	~5
Salix goodingii	black willow	FACW	1	~12
Salix laseolepis	arroyo willow	FACW	1	~10
Sambucus mexicana	Mexican elderberry	UPL	1	~12

Table 7
Upland Scrub Vegetation Communities
Applicable to Transitional upland Areas Associated
With Restoration Areas A, B, C, D, H, I, J, K

Botanical Name	Common Name	Size (gallons)	Average Spacing (feet on center)	
Artemisia californica	California sagebrush	1	5	
Baccharis pilularis	coyote brush	1	5	
Encelia californica	California brittlebush	1	5	
Eriogonum parvifolium	sea cliff buckwheat	1	5	
Heteromeles arbutifolia	toyon	1	12	
Rhus integrifolia	lemonade berry	1	12	

Table 8
Upland Scrub Seed Mix Plant Palette

Botanical Name	Common Name	Lbs/Acre
Artemisia californica	California sagebrush	8
Baccharis pilularis	coyote bush	6
Bromus carinatus	California brome	10

Table 8
Upland Scrub Seed Mix Plant Palette

Botanical Name	Common Name	Lbs/Acre
Encelia californica	California sunflower	10
Eriogonum parvifolium	sea cliff buckwheat	8
Eriophyllum confertiflorum var. *confer.*	golden yarrow	1
Hazardia squarrosa	saw-toothed goldenbush	5
Isocoma menziesii	coast goldenbush	5
Mimulus aurantiacus	bush monkeyflower	1
Scrophularia californica var. floribunda	California figwort	2
Stipa lepida	foothill needlegrass	30
Sisyrinchium bellum	blue-eyed grass	5
	Total	**46 lbs/acre**

Hydroseed Slurry:
Seeds as indicated above per mix.
2,500 pounds/acre virgin wood fiber mulch.
Ecology Controls M-Binder/seed tackifier, or approved equal, at 80 pounds/acre (for installation on slopes from November through March).
Fertilizer 11-55-0 at 200 pounds/acre.

5.6 Planting and Seeding Installation

Plant material installation must be coordinated with the Landscape Contractor, County, and the Project Biologist. Upland and riparian plant species may be installed at any time of the year when an irrigation system is used, as is predicted for portions of the Restoration Areas receiving container plants. Areas receiving seeding only may not be irrigated, relying only on natural rainfall.

All container plants will be checked for viability and general health upon arrival. Plant species and quantities will be confirmed by the Project Biologist, based upon the final restoration construction documents. All plant material and seed will have originated from Dos Pueblos Canyon watershed, or if not available from coastal Santa Barbara County within 25 miles of the Project.

Standard planting procedures will be employed for installing container plants. Holes approximately twice the size of the root-ball of the plant will be dug using a posthole digger or power auger. Holes will be filled with water and allowed to drain immediately prior to planting. Backfill soil containing amendments (such as a fertilizer tab or equivalent), as directed by the Project Biologist, will be placed in every planting hole following soaking, and container plants installed so that the top of the root-ball is at grade.

After container plants have been installed, seed mixtures will be applied to all planting areas, per the final methods outlined on the final restoration construction documents. Labels for each seed mixture will be inspected and approved by the Project Biologist prior to application. All hydroseed mixes are

to include the specified seed mix at the prescribed rates per acre, in addition to the following slurry mix components: virgin wood cellulose fiber mulch at 2,500 pounds per acre, commercial fertilizer at the specified rate as directed by the Project Biologist and soils analysis recommendations during finish grading, and a commercial binder ("Az-Tac Binder" or approved equivalent) at 100 pounds per acre, for inclusion during the rainy season (October–March). Soil imprinting will be implemented per the final specifications included in the final restoration construction documents.

5.7 120-Day Plant Establishment Maintenance

During the initial 120-day plant establishment maintenance period, following the hydroseed application and container plant installation, the Project Biologist will monitor site conditions, including seedling germination, container plant survival and soil erosion, to determine if the plants are becoming adequately established and to verify whether the hydroseed application has been successful. If the hydroseed application has been successful and adequate germination occurs, then rapid seedling emergence should preclude the need to install additional erosion control devices. Potential remedial actions, if germination is not sufficient, include reseeding, installation of additional erosion control devices, and follow-up weed control.

5.8 Restoration Schedule

It is expected that the restoration efforts will require approximately five years to develop into a system that is sufficiently established and capable of resisting invasion by weeds and exotic plant species. Within approximately the first three years the various Restoration Areas should become self-sustaining, and able to survive on natural rainfall and perennial urban flow/runoff to allow the areas to survive without the need for supplemental irrigation.

In order to help assure sufficient plant establishment, five years of maintenance and monitoring are planned to ensure that the creek, creek side slopes, and various other Restoration Areas develop into the intended habitat types and are sufficiently established by that time to survive on their own in perpetuity.

5.9 Post Construction Memorandum and As-Built Plans

Within 45 days of successful completion of the installation and the initial 120-day plant establishment maintenance period, the Project Biologist will submit a post construction memorandum/report to the ACOE, RWQCB, CDFW, and CCC documenting the completion of the installation phase and describing the "as-built" conditions of the Project. The report will include a copy of the reduced set of construction drawings and a figure showing the final "as- built" limits of the Restoration Areas. A Global Positioning System (GPS)-generated map will be produced and submitted documenting the final "as-built" conditions. Photographs will also be included to

document the site at the completion of the installation monitoring period, (i.e., at the end of the initial 120-day maintenance period).

The post construction memorandum/report will include the following:

A. Date(s) work within waters of the U.S., including wetlands was initiated and completed;

B. Summary of compliance status with each special condition of the CORPS verification, including any noncompliance that previously occurred or is currently occurring and corrective actions taken to achieve compliance;

C. Color photographs (including maps of photo points) taken at the project site before and after construction of those aspects directly associated with the permanent impacts to waters of the U.S. such that the extent of the authorized fills can be verified;

D. One copy of the "as-built" drawings for the entire project area;

E. Signed Certification of Compliance form letter (per attachment to CORPS permit);

F. Schedule for future restoration site monitoring and reporting, pursuant to Section 7.0 of the Restoration Plan.

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6 LONG-TERM FIVE-YEAR MAINTENANCE PROGRAM

The long-term five year maintenance program will begin upon the successful completion of the 120-day plant establishment maintenance period and will last for five years. The goal of the proposed restoration and enhancement is to create riparian areas that can become self-sustaining native habitats over the long term that increase biodiversity, can resist erosion and further degradation of creek hydrology, and provide enhanced wildlife habitat, including steelhead habitat. Restoration and enhancement utilizing revegetation techniques following grading, trenching, or removal activities will therefore require stringent maintenance and monitoring in the first few seasons of growth when the control of weeds and promotion of native plant growth is critical. The Landscape Contractor will be responsible for periodic weed/exotic species treatment and removals, trash and debris removals, fence and signage maintenance, adjustments to the irrigation system, and similar site maintenance functions during the five-year maintenance and monitoring period.

General maintenance practices are outlined in the sections below.

6.1 General Restoration Areas Maintenance Guidelines

6.1.1 Pest Management

Weeds and exotic/invasive plants are expected to be the primary pest problem in the restoration area during the first few years. Weeds and exotics will be controlled so that they will not prevent the establishment of the native species or invade adjacent areas. Weeds and exotics will be controlled prior to setting seed and will be removed from the site. The Landscape Contractor will control weeds and invasive exotic species within the drainage basin and in the created and enhanced areas on a regular basis. A combination of physical removal and appropriate herbicide treatments will be used to control the non-native/invasive plant species.

Weeds and non-native grasses will be adequately controlled during the 120-day plant establishment period to avoid competition with the developing species. For the remainder of the long-term five-year maintenance and monitoring period, annual weeds will be kept under control (i.e., from less than 20% cover at the end of year 1 to less than 10% cover at the end of years 2–5), so they are not a competitive threat to establishment of the desired native species. Perennial exotic/invasive species will be 5% or less at the end of year 1 and then 0% from years 2–5.

All perennial, invasive, non-native weeds and exotics will be controlled through a combination of hand removals, as well as herbicide applications, during the long-term maintenance and monitoring period. Properly timed, repeat herbicide applications will likely be required to effectively control these species. Table 9 shows the priority Non-native exotic species to be controlled within the restoration areas.

Table 9
Priority Non-native Exotic Species to Control Within the Restoration Areas Include but are not Limited to the Following

Group 1 Non-Native Weed Species to be Primarily Controlled Through Physical Removal		Group 2 Invasive Exotics to be Controlled Through Combination of Physical Removal and/or Direct Herbicide Application	
Scientific Name	*Common Name*	*Scientific Name*	*Common Name*
Brassica sp., *Hirschfeldia* sp.	mustard	*Cortaderia selloana**	pampas grass
Avena spp., *Bromus* spp., *Dactylis* sp., *Digitaria* sp., *Hordeum* sp.	non-native annual grasses	*Nicotiana glauca**	tree tobacco
		*Ricinus communis**	castor-bean
Cirsium sp., *Carduus sp.* , *Centaurea sp.*	thistles	*Schinus terebinthifolius*	Brazilian pepper
Erodium botrys, E. cicutarium	filaree	*Arundo donax**	giant reed
Lolium multiflorum	Italian ryegrass	*Foeniculum vulgare**	fennel
Malva parviflora	cheeseweed	*Eucalyptus spp.**	eucalyptus
Melilotus spp.	yellow, white clover	*Cynodon dactylon**	Bermuda grass
Picris echioides	bristly ox-tongue	*Tamarix* spp.*	salt-cedar/tamarisk
Salsola tragus	Russian thistle	*Schinus molle*	California pepper
Sonchus oleraceus	common sow-thistle	*Lepidium latifolium**	perennial pepperweed
Centaurea melitensis	tocalote	*Cynara cardunculus**	artichoke thistle
Conium maculatum	poison hemlock	*Acacia sp.*	acacia
Raphanus sativus	wild radish	—	—
Rumex crispus	curly dock	—	—
Urtica urens	dwarf nettle	—	—
		—	—

* Species likely to require herbicide treatment.

If found on site, the non-native weed species listed in Group 1, per Table 9, will be removed by direct physical methods before seed-set if possible (other species that appear may be added to this list if deemed necessary by the Project Biologist). Non-native grasses will be controlled within the Restoration Areas during the monitoring period, but complete eradication may not be possible due to the ubiquitous nature of their distribution. Group 2 invasive/exotic species may require chemical herbicide application to successfully control the species within the site. Herbicidal control may be used for persistent Group 2 plant species, as well as any additional perennial species that are low growing and difficult to control by other methods, as approved by the Project Biologist. The maintenance contractor should coordinate with the Project Biologist to identify specific sites where chemical herbicide use may be necessary. Any herbicide treatment must be specified by a certified Pest Control Advisor and applied under supervision of a qualified Pest Control Applicator.

All invasive/exotic non-native species within the Restoration Areas, as indicated previously and as specified by the California Invasive Plant Council in their invasive plant species list (Cal-IPC 2006), will be removed and adequately controlled throughout the entire 5-year maintenance period.

Method A: Hand Removal

Hand removal/physical extraction of non-native plants will be the desired/preferred method for removal, particularly around desirable native species or clusters to be preserved, where other control methods are impractical or would cause damage or residual affects to the native species. Special care will be taken to avoid trampling adjacent native vegetation while removing target exotic species by physical methods. The labor crew's ability to identify target exotic/non-native species and existing sensitive native vegetation is required to limit impacts on adjacent native vegetation. The Project Biologist will provide assistance on a limited basis for plant species identification.

Physical removal of whole plants, including the roots, is the best method for species whose root-balls can readily be pulled out with the above-ground portions of the plant. These species will be physically removed before seed-set. If hand removal is necessary only after seed-set, then seed heads will be cut-off, bagged, and removed from the site prior to the actual whole plant removal. Species that will be removed and controlled though hand removal methods are shown in Table 9.

Method B: Mechanical Removal

Non-native trees and large shrubs will be removed using mechanical methods, primarily chain saws. Cut vegetation will be removed from the area by hand and taken to adjacent access paths/roads where truck transport off-site is possible. Follow-up herbicide treatments of cut trunks may be necessary for species that readily re-sprout from the trunks (i.e., eucalyptus, acacia, tamarisk, etc.)

Method C: Chemical Treatment

All other management techniques will be employed before use of herbicide. Herbicide control will be used only for the highly invasive exotics and weeds with root systems that are impractical to remove physically. The Project Biologist will coordinate with the contractor/pest control applicator to identify specific locations where herbicide use may be acceptable. Follow-up chemical treatment may follow hand and mechanical removal activities that are conducted to increase the effectiveness of the treatment.

All herbicide treatments will abide by all federal and state laws, regulations, labeled directions, and safety precautions. All herbicide applications will be performed under the supervision of a licensed or certified Pest Control Adviser, as appropriate. Any chemical use will be conducted by a qualified

Pest Control Applicator, using methods such as brush application and/or spot spraying that minimize overspray and residual effects to adjacent/desirable native species.

Follow-up applications may be necessary for the highly aggressive exotic/invasive species that cannot be killed by hand, or with one herbicide application. Follow-up herbicide treatment should be performed at the biologically appropriate time when the recovering plants are still relatively small and before they have time to regain strength and vigor. This may require treatment during the bird breeding season. If this is necessary it will be coordinated with the Project Biologist. Legally registered herbicides may pose a threat to avian species if not used properly; refer to the Pest Control Advisor recommendations and herbicide label instructions for information about proper timing and application rates.

Herbicide label directions change with some frequency, and occasionally new products are introduced or old ones are withdrawn. Currently registered herbicides that may be used for weed control in the project area (at the time this plan was prepared) include, but are not limited to, glyphosate (trade names: AquaMaster, Roundup Pro, Roundup Pro Dry, Roundup Pro Concentrate, etc.), trilogy (trade names: Gallon 3A, Gallon 4, Pathfinder II), piquet (trade name: Reward), fluazifop-P (trade name: Fusilade II), sethoxydim (trade name: Poast), and pelargonic acid (trade name: Scythe). All, some, or none of these materials may be used to control weeds in the project area, depending on the circumstances at the time control is required. Species that may be removed and controlled by chemical methods are shown in Table 11, and per the approval of the Project Biologist.

No other pesticides and/or rodenticides will be used within the Restoration Areas unless specifically approved by the resource agencies and the Project Biologist. Sensitive wildlife species are a concern in the adjacent native habitat areas and pesticides and/or rodenticides could have a negative residual effect on these species.

6.1.2 Irrigation System Maintenance

The irrigation system will be checked regularly to ensure proper operation and adequate coverage of the Restoration Areas. Problems with the sprinkler system will be repaired immediately to reduce potential plant mortality. All broken and/or disrupted systems resulting from annual storm drain runoff will be repaired back to working conditions. The frequency and duration of irrigation applications will be adjusted seasonally by the maintenance contractor in coordination with the biological monitor to meet habitat needs. The irrigation system will be used as necessary during the first three years of the long-term maintenance and monitoring period, and will be terminated at the end of third year to ensure that the site is self-sustaining for at least two years (i.e., two summers) prior to final sign-off from the resource agencies. All above ground components will be removed completely from the restoration site by the end of the fifth year.

6.1.3 Trash and Debris Removal

Trash consists of all man-made materials, equipment, or debris dumped, thrown, washed or left within the restoration site. All trash will be removed by the maintenance contractor during each maintenance visit. Pruning or clearing of native vegetation in the majority of the site will not be done, unless extensive growth is causing a maintenance problem outside of the restoration site. Any and all pruning or clearing of native vegetation will be approved and coordinated with the biological monitor. Deadwood and leaf litter will be left in place to replenish soil nutrients and organic matter. All trash and debris washed into the drainage channel or culvert area will be removed on a regular monthly basis and after all major storm events.

6.1.4 Remedial Planting and Seeding

The restoration contractor will replace all dead container plants as defined by the success criteria. Should areas not establish as anticipated and the Project Biologist determines the area will not be able to achieve its success criteria, then additional remedial planting and/or seeding measures will be recommended by the Project Biologist, based upon approval of the responsible party. The restoration contractor will implement all remedial measures as recommended and as negotiated with the responsible party. The remedial measures will be assessed against the project same success standards unless directed otherwise by the Project Biologist.

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7 MONITORING PROGRAM REQUIREMENTS

Biological monitoring of the creek Restoration Areas has a two-fold purpose: (1) to monitor the progress of the Restoration Areas by assessing quantitative measurements, (i.e., percent native and non-native coverage, measured by transect data collection in years three through five),and through functional analysis against the performance guidelines; and (2) to direct and monitor the maintenance activities through qualitative (visual observation and evaluation) methods and determine remedial actions in a manner that ensures that appropriate maintenance occurs in a timely manner. The monitoring will be performed by the Project Biologist or Habitat Restoration Specialist.

The Biological Monitor will be responsible for monitoring the activities of the General Contractor during grading operations and initial installation activities to assure protection of existing riparian areas that are to remain untouched and that are to be protected. The Project Biologist or designated Biological Monitor will be responsible for monitoring the activities of the Landscape Contractor during the Restoration Area installation. This preparation includes initial weed control, exotic species removals, finish grading, irrigation installation, container planting, hydroseed application, and monthly monitoring during the 120-day plant establishment/maintenance period. The Biological Monitor will also provide quarterly monitoring during the five-year maintenance and monitoring period. The Biological Monitor will communicate and co-ordinate with the General Contractor and Landscape Contractor to assure the timely performance of Project activities.

7.1 General Site Requirements

The following general site characteristics must be met by the end of the five year maintenance and monitoring period.

- **Site Must Be Self-Sustaining:**

  The Restoration Areas must be self-sustaining (i.e., able to survive on their own without artificial support) by the end of the five-year maintenance and monitoring period. Determination of whether the Restoration Areas are self-sustaining will be if the temporary irrigation system has been shut-off for at least two years prior to the end of the five-year maintenance and monitoring period and the vegetation shows evidence of natural growth cycles.

- **Site Must Show Evidence of Natural Recruitment:**

  The Restoration Areas must show evidence of natural recruitment of native wetlands and/or riparian species on site. This means naturally occurring native species colonize the site in addition to the originally planted container plants or applied seed.

- **Site Must Show Evidence of Wildlife Use:**

  The Restoration Areas must exhibit signs or evidence of wildlife use during the final two years of monitoring.

- **Habitat Contiguity:**

  The Restoration Areas must contain riparian vegetation that is contiguous with upstream and downstream wetland/riparian habitats. Habitat connectivity and appropriate habitat linkages will provide nesting and foraging habitat for wildlife species.

- **Hydrologic Regime of Riparian Zone:**

  The Restoration Areas must contain some evidence of natural hydrologic riparian processes such as overbank flow, scour, or deposition (i.e., rack lines).

- **Micro- and Macro-Topographic Complexity:**

  The Restoration Areas must contain some evidence of micro- and macro-topographic complexity such as pits, ponds, hummocks, bars, rills, rock or boulders, meanders, bars, braiding, secondary channels, backwaters, and terraces. Topographic complexity will provide greater flood flow modification and flood storage functions.

- **Biogeochemical Processes:**

  The Restoration Areas must contain woody debris, leaf litter, or detritus. Expansion of riparian areas will increase natural water quality functions such as uptake of nutrients and toxicants and sediment trapping.

7.2 Performance Standards

The performance standards shown in Tables 10-12 are proposed to guide the evaluation of the Restoration Areas throughout the five-year monitoring period. The primary goal for this project is to restore and enhance riparian vegetation within the creek Restoration Areas and adjacent transitional habitats. Therefore, the following performance standard guidelines are used as a gauge to determine whether adequate native plant growth (percentage cover) and weed/exotic control is adequate to allow for the intended plant growth and development. The performance guidelines are viewed as interim project objectives designed to achieve the final restoration goals. If the restoration efforts fail to meet the performance guidelines in any one year, then the Project Biologist may recommend remedial actions to be implemented the following year to enhance the project to a level of conformance with the original guidelines. All Restoration Areas, including riparian and transitional riparian plant communities within the Restoration Areas will be included when estimating and calculating percent native cover.

Table 10
Performance Standards for Riparian Woodland Restoration Areas

Year	AWT Restoration Areas			
	Percent Survival of Container Plants	*Percent Relative Native Cover**	*Percent Relative Non-Native Cover[1]*	*Height Willows (feet)[2]*
1	100%	50%	15%	4 ft.
2	90%	60%	12%	6 ft.
3	90%	70%*	10%	8 ft.
4	90%	80%*	8%	10 ft.
5	90%	90%*	5%	12 ft.

Percent Survival = total percentage survival of all container plants, based upon the original quantity installed..
Percent Cover = total percent cover (relative) of all native plant species, including trees, shrubs, and herbs.
1 = this is an annual maximum value (Note: No invasive/exotic species cover is allowed in any year)
2 = this is an average in feet based on visual estimates.
* Percentage value based on visual estimates in years 1 and 2 and quantitative transect data (relative cover) in years 3 through 5.

Table 11
Performance Standards for Mulefat Scrub Restoration Areas

Year	*Percent Survival of Container Plants*	*Percent Relative Native Cover**	*Percent Relative Non-Native Cover[1]*
1	100%	40%	15%
2	90%	50%	12%
3	90%	60%	10%
4	90%	70%	8%
5	90%	80%	5%

Percent Survival = total percentage survival of all container plants.
Percent Cover = total percent cover (relative) of all native plant species, including trees, shrubs, and herbs.
1 = this is an annual maximum value (Note: no invasive/exotic species cover is allowed in any year)
* Percentage value based on visual estimates in years 1 and 2 and quantitative transect data in years 3 through 5.

Table 12
Performance Standards for Upland Scrub Restoration Areas

Year	Upland Scrub Restoration Areas		
	Percent Survival of Container Plants	*Percent Relative Native Cover**	*Percent Relative Non-Native Cover[1]*
1	100%	40%	15%
2	90%	50%	12%
3	90%	60%	10%
4	90%	70%	8%
5	90%	80%	5%

Percent Survival = total percentage survival of all container plants.
Percent Cover = total percent cover (relative) of all native plant species, including trees, shrubs, and herbs.
1 = this is an annual maximum value (Note: No invasive/exotic species cover is allowed in any year)
* Percentage value based on visual estimates in years 1 and 2 and quantitative transect data in years 3 through 5.

All container plantings will have 100% survival the first year, 90% at the end of year two and 80% survival thereafter. A loss of container species beyond the performance standards can be replaced by documentable native recruitment. Native cover performance standards were developed based on the specific vegetation community being restored and the expected cover of those communities. Annual weed species cover will be held to less than 5% maximum by the end of year five in all vegetation communities. Invasive/exotic, noxious weed species will be controlled throughout the five year period, resulting in 0% cover of invasive/exotics/noxious weeds in any one year.

7.3 CRAM Assessments

In addition, Project success will also be evaluated using the California Rapid Assessment Method (CRAM). The state and federal agencies that comprise the California Wetlands Monitoring Workgroup (CWMW)[2] are promoting the use of rapid assessment methods as a core tool to evaluate aquatic resource conditions. Currently, CRAM is the most widely used wetland rapid assessment method in the State (www.cramwetlands.org).

A CRAM assessment will be performed at Restoration Areas (6 total) prior to installation of the Project. The purpose of the assessment will be to evaluate the ecologic conditions of the riparian corridor prior to Project construction to be used as a baseline for future CRAM evaluations. The most recent version of CRAM (CWMW 2013), version 6.1, will be used to evaluate this Project.

A pre-project CRAM analysis will be performed by the Project Biologist to evaluate the baseline condition of the riparian system at six of the Restoration Areas. The pre-project CRAM scores will establish the baseline for comparative purposes during the monitoring program. A forecasted CRAM will also be performed, following the initial CRAM survey and prior to the installation of the Project. CRAM evaluations will be performed again in year three and finally at year five of the Project post installation, at the time of annual quantitative monitoring.

In CRAM, an Assessment Area (AAs) is established for the representative wetland class (i.e., riverine) and can represent a portion of, or encompass the entire wetland community. The non-confined riverine AA encompasses the entire Project boundary, therefore, pre and post-project CRAM scores are reflective of the same general area.

7.3.1 CRAM Background

CRAM was designed as a scientifically defensible and repeatable assessment methodology that could be used routinely to assess and monitor the condition of wetlands and riparian habitats. CRAM was developed through collaborations among the San Francisco Estuary Institute, the Southern California

[2] The CWMW is a subcommittee of the California Water Quality Monitoring Council (Senate Bill 1070; Kehoe, 2006).

Coastal Water Research Project, the Central Coast District of the California Coastal Commission, and the Moss Landing Marine Laboratory.

CRAM provides a means of assessing wetland conditions based on field observations that correlate to quantitative measures of wetland function, condition, or beneficial use that vary predictably along gradients of environmental stress. Stressors such as habitat conversion, biological invasion, hydro-modification, and pollution are anthropogenic causes of changes in wetland function.

CRAM scores are based on best-fit narrative descriptions of habitat condition among a standardized set of mutually exclusive descriptions. Each wetland class has a particular set of narrative descriptions that allow comparison of CRAM scores within a wetland class, but not between classes for local, regional, and statewide monitoring purposes. CRAM attributes and metrics are presented in Table 13.

Table 13
CRAM Attributes and Metrics

Attributes		Metrics	
Buffer and Landscape Context		Landscape Connectivity	
		Buffer	Submetric A: Percent of AA with Buffer
			Submetric B: Average Buffer Width
			Submetric C: Buffer Condition
Hydrology		Water Source	
		Hydroperiod or Channel Stability	
		Hydrologic Connectivity	
Structure	Physical	Structural Patch Richness	
		Topographic Complexity	
	Biotic	Plant Community	Submetric A: Number of Plant Layers Present or Native Species Richness (vernal pools only)
			Submetric B: Number of Co-dominant Species
			Submetric C: Percent Invasion
		Horizontal Interspersion and Zonation	
		Vertical Biotic Structure	

Source: CWMW 2013.
Note: AA = assessment area

Each metric and sub-metric is initially given a letter score A through D. The letter scores are converted to numerical scores upon completion of the CRAM assessment, and metric and sub-metric scores are combined to create the four attribute scores. The total attribute scores are calculated by dividing the raw attribute score (the sum of each metric and/or sub-metric within an attribute) by its maximum possible raw score. Each final attribute score has a potential maximum value of 1.00 and a minimum value of 0.25. The overall CRAM score for each assessment area (AA) is calculated by averaging the four final attribute scores. The total overall CRAM score can range from 0.25 to 1.00.

7.3.2 CRAM Success Criteria

The success of the Restoration Areas will be based in part on the Restoration Areas achieving at least 90% of the CRAM score for the best condition achievable (i.e., the forecasted CRAM score) by the end of the five-year maintenance and monitoring period. A CRAM analysis will be conducted during the third year to help determine if remedial measures are needed and again near the end of the fifth year to ascertain if the target CRAM scores have been achieved. The "target attribute score" is 90% of the forecasted post-project score, evaluated on a per metric basis, and is considered to be a realistic success standard to obtain by the end of the five-year maintenance and monitoring period. The CRAM forecast analysis will be based on the design of the Restoration Areas and on the available reference natural conditions.

7.4 Monitoring Schedule and Methods

The Biological Monitor will conduct quarterly qualitative monitoring visits (based upon visual analysis) during year 1 and bi-annual (twice/year) monitoring visits during years 2–5, to assess site conditions. The monitor will assess native plant establishment and health, weed and exotic species establishment, trash and debris issues, channel bank stability, and soil erosion problems. Recommendations for maintenance efforts will be based upon these site inspections. Weed control by the maintenance contractor will be conducted monthly during the first year of the maintenance and monitoring period, and then quarterly during year two through five of the maintenance and monitoring period, and as directed by the Project Biologist and/or Biological Monitor.

CRAM assessments will be conducted in the third and fifth years. The third year assessment will be conducted to help determine if the project is on track or if remedial measures are needed. If the final CRAM success criteria have not been achieved by the third year, a final CRAM analysis will be conducted near the end of the fifth year to ascertain if the target CRAM scores have been achieved.

7.4.1 Qualitative Monitoring

Qualitative monitoring is defined as monitoring based upon visual assessments and qualitative judgments regarding the progress of the Restoration Areas. This work is conducted through observations and visual estimates regarding current conditions. Qualitative monitoring of the mitigation site will be performed by the Project Biologist during the initial 120-day plant establishment period and throughout the duration of the 5-year monitoring period. Qualitative monitoring will be conducted to provide an overall characterization of the Restoration Areas, including progress toward performance standards and to evaluate the performance of the Restoration Contractor. General observations may include the prevalence of annual weeds and invasive species,

condition of planted container plants, germination of applied seed, recruitment of native plant species, condition and function of the irrigation system, and any general maintenance issues.

Oak, willow, sycamore, alder and cottonwood trees will be monitored throughout the duration of the 5-year maintenance and monitoring period. Tree health and mortality totals will be evaluated during each site visit.

Observations of will be used to document the year-end conditions in the annual monitoring reports. All qualitative monitoring visits to the project site will be documented with a site observation monitoring report, which will be forwarded to the Restoration Contractor, client, and County staff, as applicable.

7.4.2 Quantitative Monitoring

Quantitative monitoring will be conducted by establishing permanent vegetation transects within the Restoration Areas at random locations at the end of year one. These transects will be utilized to help determine achievement of the yearly performance standards and compliance with agency standards, and a permanent photo-documentation station will be established along each transect to record the progress of the mitigation site and graphically record plant establishment over the 5-year period. Transects will be sampled using the point-intercept method in the riparian Restoration Areas. Quadrats evaluated along established transects will be utilized to evaluate percent cover in the Restoration areas and Enhancement Areas. The Project Biologist will establish transect locations.

The point intercept methods will evaluate the Restoration Areas that will aim to sustain structural diversity, in the form of herb, shrub and canopy layers. A transect tape will be run between two posts, and vegetative intercept line will be visually projected above and below the tape at every half-meter mark. Transects may vary in length based on location, and size of the individual restoration or enhancement area. Each herb, shrub, or tree that intercepts the projected line will be recorded by species. In addition, all plant species present within the 5-meter-wide "species richness" portion of each transect will be recorded by species. All data will be utilized to determine total percent plant cover, percent native cover, percent non-native cover, and overall species richness.

Quadrats along established transects will be utilized to evaluate the herbaceous communities associated with the various Restoration Areas. The meter-squared quadrat will be placed along each transect every 2 meters, for a total of 10 - 25 data collection points. Visual percent cover estimates will be taken by the Project Biologist for each native and non-native species present in the quadrat, as well as any shrub species that occur within the quadrat. The resulting data will be analyzed to provide values for relative native and non-native cover and presence of shrub species, to be reviewed against the performance standards for each habitat type.

Data collection will be initiated starting in year three and continuing through year five. The results of the quantitative data analysis will be presented in the year three–five annual monitoring reports and will assess the progress of the mitigation program against the established performance standards (see Section 7.2).

The transect measurements will be used to evaluate representative site conditions, and to determine percent cover of native and non-native species. Cover of weeds and exotics will be determined by visual inspections of the entire restoration site to assure that invasive perennial non-native/exotic plants are not present and/or if present are identified for removal. Monitoring visits should assess compliance with the intended yearly guidelines and the need for re-seeding and/or weeding.

7.4.3 CRAM Assessments

Monitoring of the functions and services will be conducted using CRAM. The monitoring CRAM assessment in year three and year five will be conducted in the same manner as the pre-project and post-project forecast CRAM assessments, using the same AA boundaries, since these are not forecasted to change after Project implementation.

The same version of CRAM that was used to assess the baseline conditions (Version 6.0) will be used to assess the condition of the site during the monitoring period to ensure consistency of scoring. Later versions of CRAM could be used if they do not include changes that affect the scoring of the metrics, and overall comparative assessment of the restoration site relative to baseline conditions.

7.5 Annual Biological Monitoring Reports

A year end biological monitoring report, outlining the results of each year's monitoring surveys, within the Restoration Areas, will be submitted to the responsible party ACOE, RWQCB, CDFW, USFWS, CCC and Santa Barbara County staff by the end of each year's monitoring period, and as described in the final resource agency permits, based upon the anniversary date of completion of the installation, through the end of the five-year maintenance and monitoring period. The monitoring reports will describe the current yearly conditions of the site, compare current conditions with the yearly performance guidelines, identify any shortcomings of the restoration program, and recommend remedial measures necessary to help guide the project to a successful completion of the on-site restoration program.

The reports also will include the following:

- A list of names, titles and companies of all persons who prepared the content of the annual report and participated in maintenance and monitoring activities.
- Prints of representative monitoring photographs.
- Maps identifying monitoring areas, transect locations, planting zones, etc. as appropriate.
- Results of all qualitative and quantitative monitoring efforts.

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8 COMPLETION OF RESTORATION

8.1 Notification of Completion

When the responsible party and Biological Monitor believe that the final year five performance guidelines/standards have been met at the end of the five-year maintenance and monitoring period, they will then notify the permitting agencies upon submitting the final annual report and will request in writing acknowledgement of acceptance of the site and release from the permit conditions and any bonds or letters of credit that may have been placed on the project.

8.2 Agency Confirmation

Following receipt of the notification of completion from the responsible party, representatives from the permitting agencies may visit the site to confirm the completion of the restoration effort.

Written acceptance and/or concurrence from the permitting agencies will be solicited in order to signify and document completion of the restoration obligations.

8.3 Contingency Measures

If annual performance guidelines are not met for all or any portion of the restoration project in any year, the responsible party and Biological Monitor will prepare an analysis of the cause(s) of failure and will propose remedial actions, if determined necessary, in order to meet the success criteria. If at the end of the five-year maintenance and monitoring period, the restoration site has not met the success criteria, the responsible party's maintenance and monitoring obligations will continue, or alternative contingency measures will be negotiated, until the permitting agencies give final project permit compliance/approval, or approval for alternative compensation measures.

8.4 Adaptive Management Plan

An adaptive management approach will be implemented in the event of unforeseen or probable but unpredictable circumstances. Adaptive management is defined, for the purposes of this restoration project, as a flexible, iterative approach to the long-term management of biological resources that is directed over time by the results of ongoing monitoring activities and direct observation of environmental stressors that are producing adverse results within the Restoration Areas.

Adaptive management will include the utilization of regular qualitative assessments and rapid qualitative assessment data gathered in the field prior to and/or throughout the monitoring period to assess the health and vigor of habitat within the restoration site. Following an event that causes damage to all or part of the restoration site, these data will be used in part to drive management

considerations for repair of the damaged areas. Achieving the key goals of the restoration program and establishment of self-sustaining native habitats will be the focus of all adaptive management decisions. Individual environmental stressors are discussed below, along with an anticipated range of management responses to correct any damage that may occur to the Restoration Areas.

8.4.1 Drought

Seasonal drought is an annual cycle in Santa Barbara County and the designated plant palettes for the Restoration Area habitat types, have been designed with plant species that are capable of withstanding seasonal fluctuations in available moisture. However, an extended drought could potentially occur, including low seasonal rainfall and prolonged high temperatures that may negatively affect the establishment and development of mitigation site (e.g., lower native cover, higher plant mortality, increased potential for pest infestations on site, etc.).

If drought conditions limit native vegetation development, the temporary irrigation system may need to be used for a longer period of time than originally envisioned in order to sustain the plants until natural rainfall patterns return to normal. The monitoring period may need to be extended if the Restoration Area performance standards cannot be met by the end of the 5-year period.

8.4.2 Herbivory

Some grazing and browsing by native herbivores is expected to occur within the Restoration Areas. The plant palettes and planting methods for each vegetation community have been designed to tolerate a moderate level of plant browsing. If browse levels should become elevated (i.e., if significant plant mortality and cover reduction occurs), as indicated by qualitative monitoring of the Restoration Area, then remedial measures will need to be implemented. Browse guards (i.e., plastic fencing and/or tree shelters/wire cages) may need to be installed around the base of trees and young shrub plants in affected areas, in order to reduce plant mortality. In addition, remedial planting or seeding may be necessary, depending upon the stage of habitat development.

8.4.3 Fire

Santa Barbara County has experienced periodic wildfires. Vegetation communities native to the area are adapted to this periodic fire regime, with plant species possessing the ability to stump sprout, or otherwise regenerate from remnant trunk and underground root systems. While fire is a co-evolutionary factor, it also presents the possibility for faster-growing, early successional non-native and exotic weed species to out-compete the recovering native species. In the event of fire affecting the Restoration Areas, the Project Biologist will assess the post-fire conditions and provide adaptive management recommendations in coordination with the permit holder(s), Santa Barbara County, and the resource agencies on how to proceed with remedial measures if necessary.

8.5 Notification of Completion

The Project Biologist, on behalf of the responsible party, upon submitting the final annual report for the final year in which the ultimate performance standards have been met, (i.e., typically at the end of the 5-year monitoring period), will request confirmation that the project has met its performance goals from the resource agencies and is ready for final acceptance. Early release may be possible if performance standards are met early and the permitting agencies agree with the level of establishment achieved. Removal of the temporary supportive and protective measures such as temporary irrigation, perimeter fencing, erosion control devices, and signage could occur prior to final Restoration Area sign-off.

8.6 Regulatory Agency Confirmation

Following receipt of the notification of completion, the permitting agencies may visit the site to confirm completion of the mitigation program and will issue formal letters of final acceptance.

8.7 Long-Term Site Maintenance, Management and Site Protection

After successful completion of the five-year maintenance and monitoring period, the Restoration Areas are expected to function as naturally regenerating and self-sustaining native habitat.

The majority of the creek will be subject to an agricultural conservation easement (ACE) that will be subject to approval by the California Department of Conservation (CDOC). It is recommended that the responsible party and permitting agencies, work with the (CDOC) to incorporate into the ACE provisions that will ensure long-term maintenance and preservation of the Restoration Area in qualitatively similar conditions to what was achieved under this Restoration Plan at the end of the long-term five-year maintenance and monitoring period.

8.8 Protective Mechanisms

It is recommended that the ACE include a covenant to (i) protect and maintain the Restoration Areas and preservation areas as natural open space consistent with agricultural use in perpetuity; (ii) preclude establishment of fuel modification zones, additional paved public trails, additional drainage facilities, additional creek obstructions, additional maintenance access roads and/or future easements, except as provided in the restoration area descriptions; (iii) to cite any such additional facilities outside of the Restoration Area to minimize indirect impacts on the avoided, restored (i.e., re-established), enhanced and preserved creek riparian areas, to the extent reasonably practicable,.

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9 LONG-TERM MANAGEMENT

The ACE should provide that upon completion of the restoration program and achievement of the performance standards outlined in Section 6.1, the Restoration Areas will be managed in perpetuity by the responsible party or a qualified land manager

9.1 Funding Mechanism

The ACE should provide for a necessary non-wasting endowment, or other funding arrangement, for maintenance and monitoring responsibilities for the first five years, or until the performance standards outlined herein are met.

9.2 Land Manager Qualifications

Long-term management and maintenance of the Restoration Area will be the obligation of the an approved land management entity. The land management entity will include qualified biologist/restoration ecologist and wildlife biologists, as necessary, to implement a long-term management plan based upon a strategy of Adaptive Management. Adaptive Management is defined as the ongoing evaluation of biological management techniques in light of monitoring results and other new information. These periodic evaluations are used over time to adapt both the management objectives and techniques to better achieve overall resource management goals. The land management entity will consult with the permitting agencies, as necessary, prior to implementing the adaptive management changes.

9.3 Long-Term Biological Monitoring

The responsible party and land management entity will be responsible for maintenance and monitoring of the Restoration Areas, consistent with permitting agency requirements.

9.4 Long-Term Maintenance

Long-Term maintenance work within the Restoration Areas, will be conducted as needed to obtain the goals outlined herein. Maintenance will be conducted for the life of the project in order to prevent the spread of invasive /non-native exotic species. Maintenance will focus on the timely control/removal of non-native weeds within the Restoration Areas.

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10 ACKNOWLEDGMENTS

This report was prepared by Dudek staff members including: April Winecki (Senior Coastal Planner); John L. Minchin (Habitat Restoration Specialist/Landscape Architect #2225); Jayme Timberlake (Habitat Restoration Specialist); Craig Seltenrich (Aquatic Specialist); Denis Ruttenberg, P.E. (Balance Hydrologics, Hydrologist/Geomorphologist); Heather Moine (Biologist), Nina Isaieva (GIS/Graphics Specialist) and various Dudek Publications staff (word processing).

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APPENDIX A

Vascular Plant Species Observed On Site
(Dudek, March 2015)

APPENDIX A
Vascular Plant Species Observed on Site

VASCULAR PLANT SPECIES

GYMNOSPERMS AND GNETOPHYTES

CUPRESSACEAE—CYPRESS FAMILY

* *Sequoia sempervirens* – redwood

ANGIOSPERMAE (DICOTYLEDONES)

ADOXACEAE – MUSKROOT FAMILY

Sambucus nigra ssp. *caerulea*—blue elderberry

AIZOACEAE – *CARPET-WEED FAMILY*

* *Carpobrotus edulis* – hottentot-fig

Tetragonia tetragonoides—New Zealand spinach

ANACARDIACEAE – *SUMAC FAMILY*

Malosma laurina—laurel sumac

Rhus integrifolia—lemonade sumac

Toxicodendron diversilobum—Pacific poison oak

* *Schinus molle* – Peruvian pepper-tree

APIACEAE – *CARROT FAMILY*

* *Conium maculatum* – poison-hemlock

* *Foeniculum vulgare* – sweet fennel

ASTERACEAE – *SUNFLOWER FAMILY*

Artemisia californica – coastal sagebrush

Artemisia douglasiana – Douglas' mugwort

Baccharis pilularis – coyote brush

Baccharis salicifolia – mulefat

Bidens pilosa—hairy beggarticks

* *Centaurea melitensis*—Maltese star-thistle

Cirsium vulgare—bull thistle

Cotula coronopifolia—common brassbuttons

* *Delairea odorata*—Cape-ivy

* *Encelia californica*—California brittlebush

Helianthus annuus—common sunflower

Helminthotheca echioides—bristly oxtongue

*Heterotheca grandiflora—t*elegraphweed

Lactuca serriola—prickly lettuce
Matricaria discoidea—disc mayweed
* *Pseudognaphalium luteoalbum*—Jersey cudweed
* *Senecio vulgaris*—old-man-in-the-Spring
* *Silybum marianum*—blessed milkthistle
* *Sonchus oleraceus*—common sowthistle
* *Sonchus asper*—spiny sowthistle

BETULACEAE—BIRCH FAMILY
Alnus rhombifolia—white alder

BRASSICACEAE – *MUSTARD FAMILY*
* *Brassica nigra* – black mustard
* *Brassica rapa*—field mustard
* *Capsella bursa-pastoris*—shepherd's purse
Nasturtium officinale—watercress
* *Raphanus sativus* – wild radish

CARYOPHYLLACEAE—PINK FAMILY
Spergularia bocconi—Boccone's sandspurry
Stellaria media—common chickweed

CONVOLVULACEAE—MORNING-GLORY FAMILY
Calystegia macrostegia—island false bindweed

FABACEAE – PEA FAMILY
* *Acacia pycnantha*—golden wattle
Lupinus succulentus—hollowleaf annual lupine
* *Medicago polymorpha*—burclover
* *Melilotus indicus*—annual yellow sweetclover
Vicia villosa—winter vetch

FAGACEAE – *BEECH FAMILY*
Quercus agrifolia – coast live oak

GERANIACEAE – *GERANIUM FAMILY*
* *Erodium cicutarium* – red-stemmed filaree
* *Erodium moschatum*—musky stork's bill
* *Geranium dissectum*—cutleaf geranium

MYRSINACEAE—MYRSINE FAMILY

* *Lysimachia arvensis*—scarlet pimpernel

MYRTACEAE—MYRTLE FAMILY

* Eucalyptus globulus—Tasmanian bluegum

OLEACEAE—OLIVE FAMILY

Olea europaea—olive

OXALIDACEAE—OXALIS FAMILY

* *Oxalis pes-caprae*—Bermuda buttercup

PHRYMACEAE—LOPSEED FAMILY

Mimulus aurantiacus—orange bush monkeyflower

PITTOSPORACEAE—PITTOSPORUM FAMILY

* *Pittosporum undulatum*—Australian cheesewood

PLANTAGINACEAE—PLANTAIN FAMILY

Keckiella cordifolia—heartleaf keckiella
Plantago lanceolata—narrowleaf plantain
Plantago major—common plantain

POLEMONIACEAE—PHLOX FAMILY

Linanthus californicus—California prickly phlox

POLYGONACEAE—BUCKWHEAT FAMILY

* *Rumex crispus*—curly dock
Eriogonum elongatum—longstem buckwheat

RANUNCULACEAE—BUTTERCUP FAMILY

Clematis ligusticifolia—western white clematis

RHAMNACEAE—BUCKHORN FAMILY

Ceanothus spinosus—redheart
Frangula californica—California buckthorn

ROSACEAE – ROSE FAMILY

Heteromeles arbutifolia—toyon
Rosa californica – California rose
Rubus ursinus – California blackberry

RUBIACEAE—MADDER FAMILY

* *Galium angustifolium*—narrowleaf bedstraw

* *Galium aparine*—stickywilly

SALICACEAE – WILLOW FAMILY

Populus fremontii – Fremont's cottonwood

Salix exigua – narrow-leaved willow

Salix gooddingii var. *gooddingii* – black willow

Salix lasiolepis var. *bracelinae* – arroyo willow

SCROPHULARIACEAE—FIGWORT FAMILY

* *Myoporum laetum*—ngaio tree

SOLANACEAE – NIGHTSHADE FAMILY

* *Solanum douglasii*—greenspot nightshade

Solanum xanti—chaparral nightshade

* *Nicotiana glauca* – tree tobacco

TROPAEOLACEAE—NASTURTIUM FAMILY

* *Tropaeolum majus*—nasturtium

URTICACEAE – NETTLE FAMILY

Urtica dioica – giant creek nettle

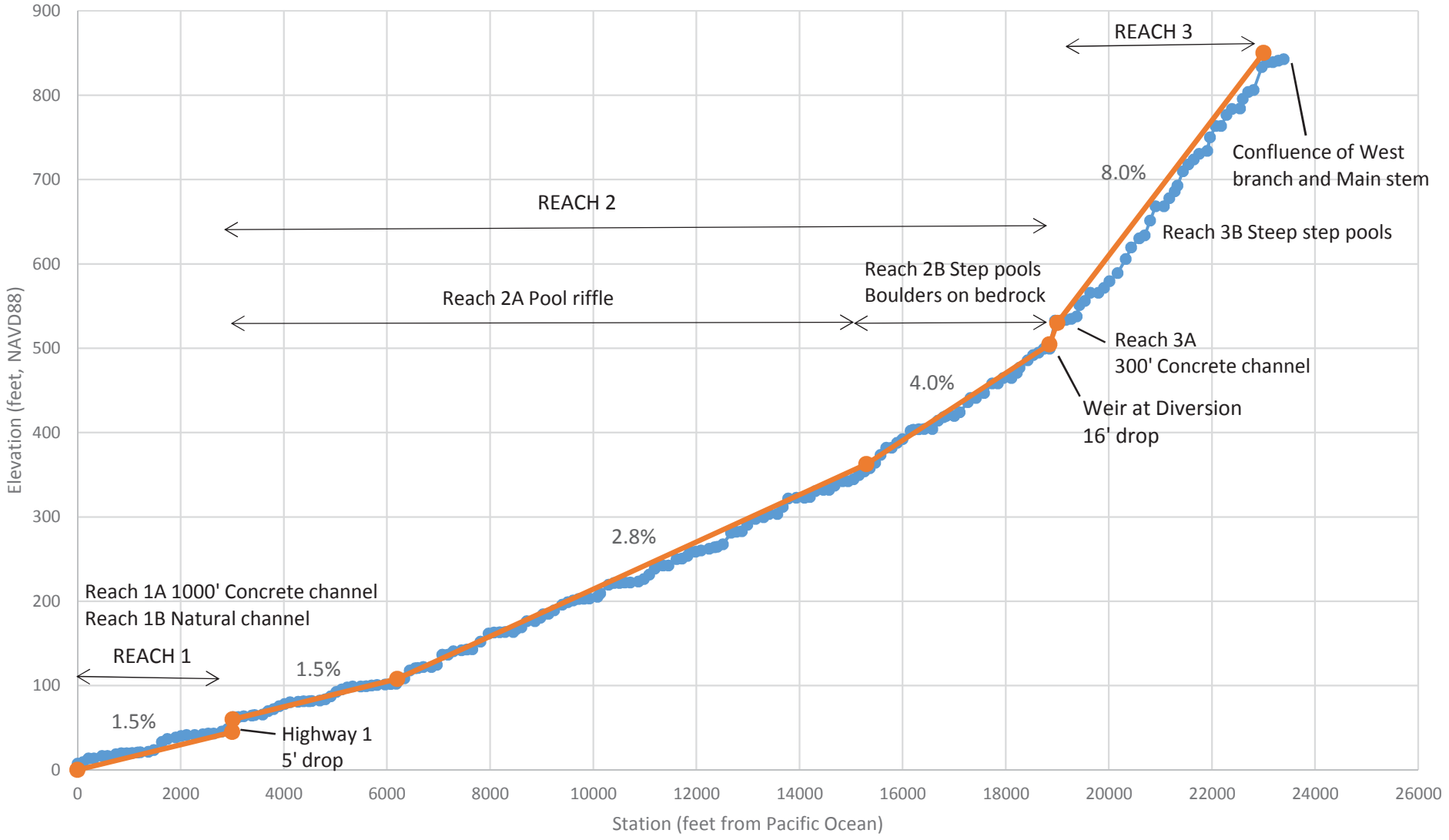
VERBENACEAE—VERVAIN FAMILY

Verbena lasiostachys—western vervain

* signifies introduced (non-native) species

APPENDIX B

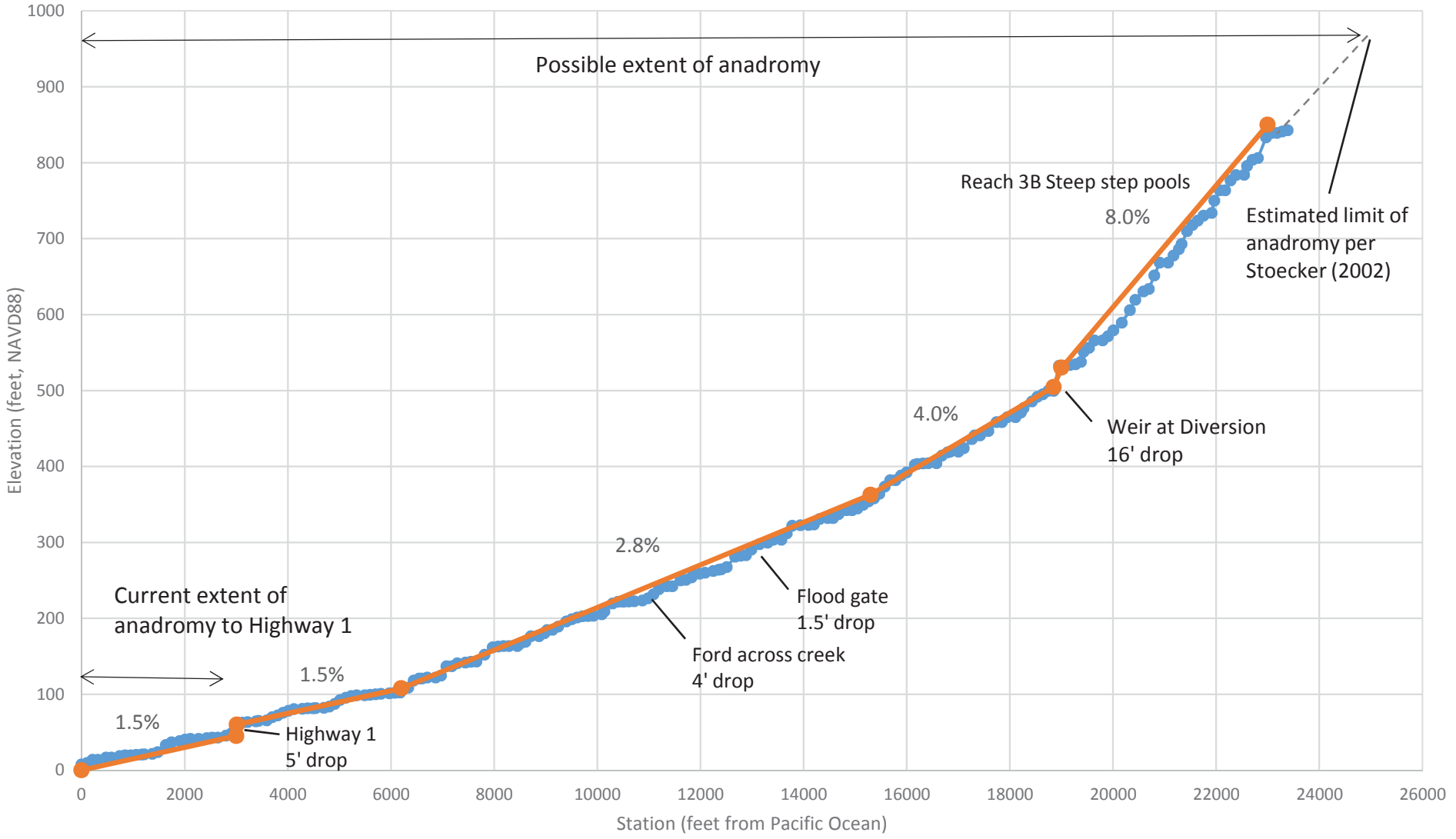
Hydrology and Aquatic Resources Survey Data



Balance Hydrologics, Inc.

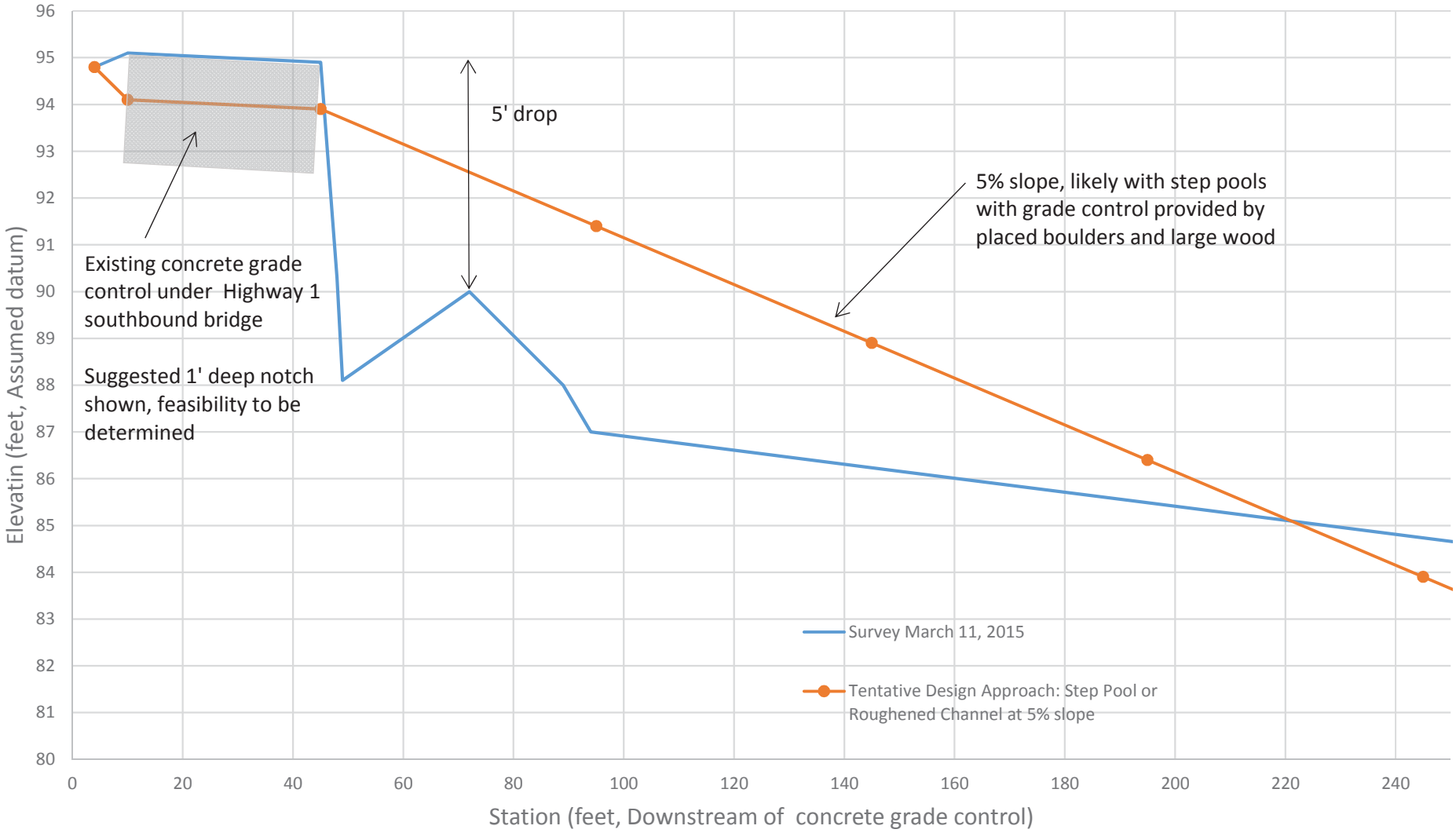
Figure B-1: Reach profile of Dos Pueblos Creek showing average reach slopes, Santa Barbara County, CA,

Data source: USGS StreamStats GIS analysis March 2015



Balance Hydrologics, Inc.

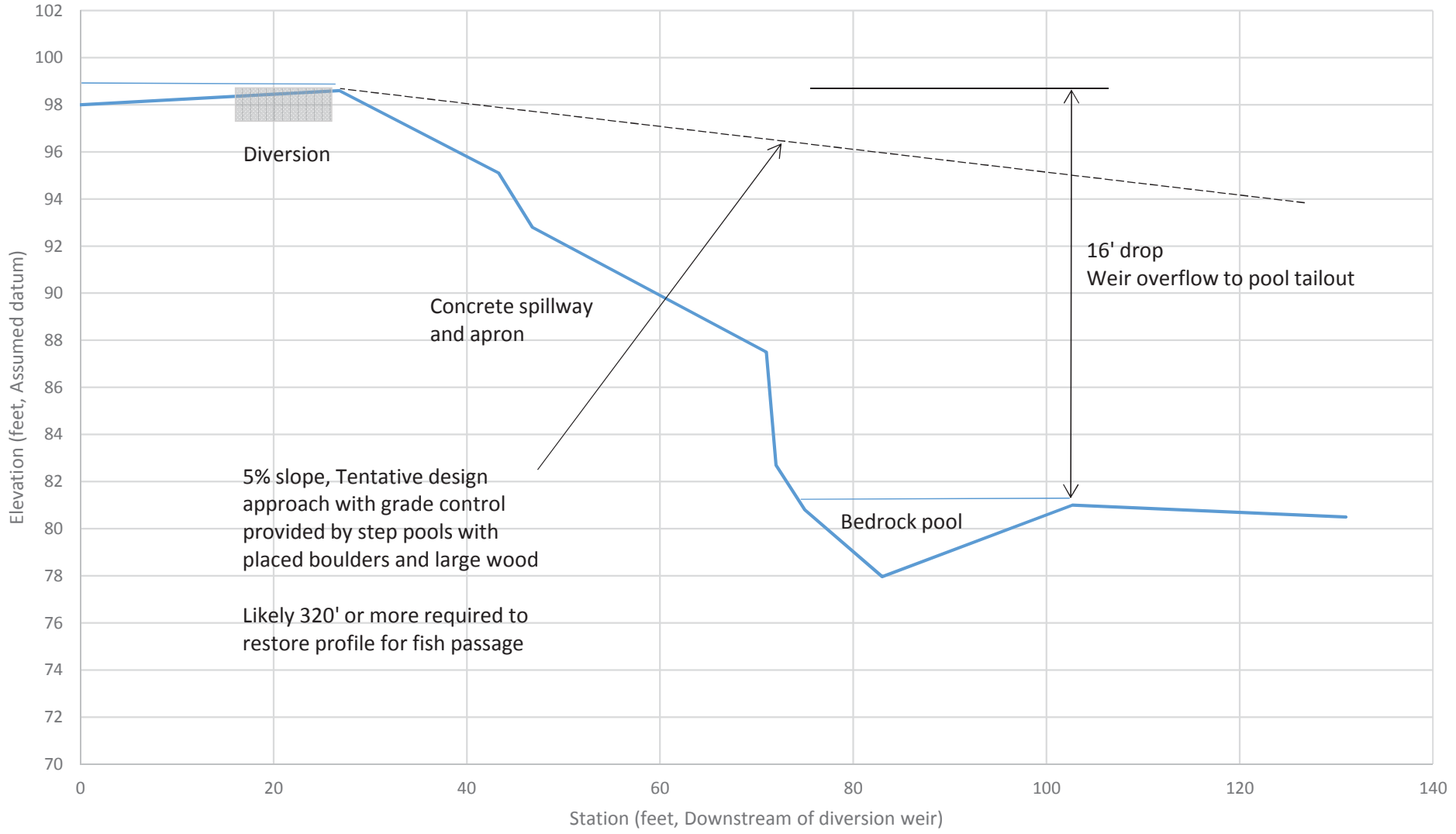
Figure B-2: Reach profile of Dos Pueblos Creek showing locations of main fish barriers and potential restoration of fish passage, Santa Barbara County, CA,
Data source: USGS StreamStats GIS analysis March 2015, Stoecker (2002)



Balance Hydrologics, Inc.

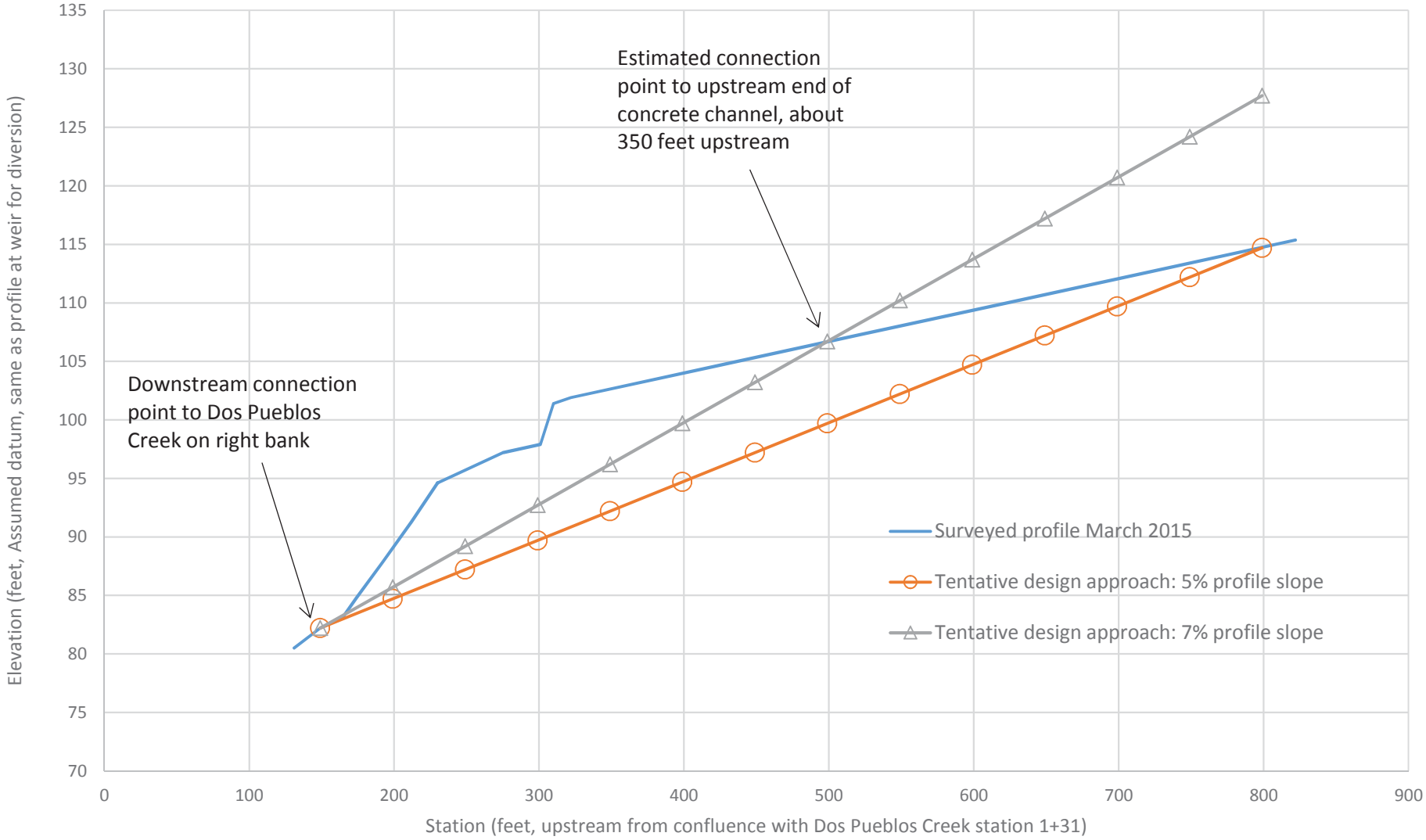
Figure B-3: Surveyed profile of grade control at Highway 1 on Dos Pueblos Creek and concept design profile, Santa Barbara County, CA

Data source: Hand level survey by Balance Hydrologics, Inc. on March 11, 2015



Balance Hydrologics, Inc.

Figure B-4: **Surveyed profile of weir and main channel at diversion, Dos Pueblos Creek, Santa Barbara County, CA,**
Data source: Hand level survey by Balance Hydrologics, Inc. on March 11, 2015



Balance Hydrologics, Inc.

Figure B-5: Surveyed profile of weir and main channel at diversion, Dos Pueblos Creek, Santa Barbara County, CA,
Data source: Hand level survey by Balance Hydrologics, Inc. on March 11, 2015

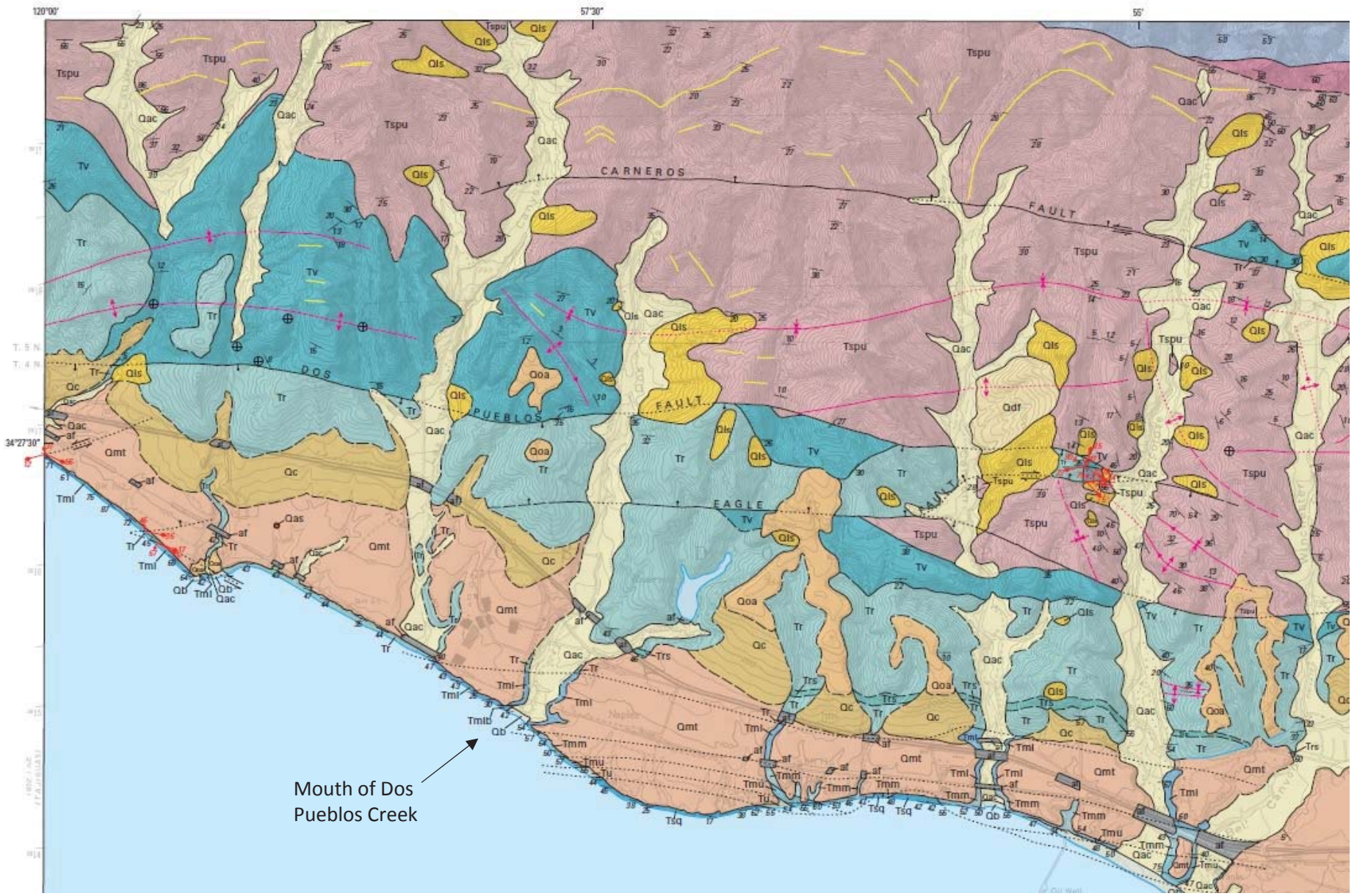
Balance Hydrologics, Inc.

Figure B-6: **Draft Concept at Diversion weir and proposed bypass channel, Dos Pueblos Creek, Santa Barbara County, CA.**

215026 Dos Pueblos draft concept bypass.dwg 04-15-15

Appendix B-7
Dos Pueblos Creek
Summary of flow and water quality measurements by Balance Hydrologics, Inc.

Date	time	measurement	location	value	units	notes
3/10/2015	13:30	conductivity	open outfall from aquaculture	52,000	µS / cm	34 ppt, 16 deg C, salt water
3/10/2015	13:45	conductivity	bubbling outfall from aquaculture	38,000	µS / cm	25 ppt, 16 deg C, salt water
3/10/2015	13:40	conductivity	Dos Pueblos Creek at mouth	285	µS / cm	1.5 ppt, 18.6 deg C
3/10/2015	16:30	flow	about 100 ft downstream of Casa Grand Rd.	0.14	cfs	gravel/cobble bed, upstream of conc channel
3/10/2015	16:50	conductivity	about 100 ft downstream of Casa Grand Rd.	1740	µS / cm	1 ppt, 15.8 deg C
3/11/2015	13:15	flow	Above weir diversion	0.37	cfs	Flow on concrete bed, shallow
3/11/2015	13:30	conductivity	Above weir diversion	804	µS / cm	0.4 ppt, 13.5 deg C
3/11/2015	14:50	flow	At US 101 grade control	0.05	cfs	Plunging flow into bucket



Balance Hydrologics, Inc.

Figure B-8: Geology map of Dos Pueblos Creek, Santa Barbara County, CA,
Data source: Brandt (2007)

Figure B-9: Legend to geology map of Dos Pueblos Creek, Santa Barbara County, CA,
Data source: Brandt (2007), USGS Scientific Investigations 3001

Appendix Table B-10. Dos Pueblos Creek habitat typing immediately downstream of the La Casa Grande Bridge

Stream Habitat Assessment Survey **Date:** March 10, 2015

			Length	Ave Width	Water Depth (cm)		Substrate (%)								Cover (%)			
Habitat No.	Type	Characteristics	(m)	(m)	Max	Ave	Silt	Sand	Fine Gravel	Coarse Gravel	Cobble	Boulder	Bedrock	Concrete	Canopy	Instream	Objects	Riparian Vege
1	MCP	Main channel pool	32	3.3	30	20	20	10	5	10	45	10			45	10	25	80
2	LGR	Low gradient riffle	2	2.1	10	6	5	15	10	10	60	10			10	0	5	50
3	SR	Step-run	2.5	2.5	20	16	10	5	10	10	55	10			55	15	10	40
4	LGR	Low gradient riffle	1.5	2.2	10	5	5	5	5	10	60	15			50	5	20	50
5	SR	Step-run	14	2.8	22	12	10	10	10	5	55	10			45	10	15	50
6	LGR	Low gradient riffle	4	3.2	8	4	5	5	5	5	75	5			35	0	10	60
7	R	Run	21	2.8	30	18	15	5	5	10	60	5			50	15	15	30
8	LGR	Low gradient riffle	3.1	2	10	5	5	10	5	5	70	5			20	0	10	20
9																		
10																		
Total length of reach			80.1 m															

Appendix Table B-11. Dos Pueblos Creek habitat typing immediately downstream of the grade control structure beneath Highway 101

Stream Habitat Assessment Survey **Date:** March 11, 2015

			Length	Ave Width	Water Depth (cm)		Substrate (%)								Cover (%)			
Habitat No.	Type	Characteristics	(m)	(m)	Max	Ave	Silt	Sand	Fine Gravel	Coarse Gravel	Cobble	Boulder	Bedrock	Concrete	Canopy	Instream	Objects	Riparian Vege
1	Run	Run	19.7	4	43	24	5	10	5	10	50	20			60	20	15	70
2	LGR	Low gradient riffle	3.3	3.3	12	6	5	5	5	10	60	15			90	0	0	30
3	MCP	Main channel plunge pool below structure	8.2	5.2	110	50	5	5	5	25	40	20			80	20	10	30
4																		
Total length of reach			31.2 m															

Appendix Table B-12. Habitat typing immediately upstream of the grade control structure beneath Highway 101

Stream Habitat Assessment Survey **Date:** March 11, 2015

			Length	Ave Width	Water Depth (cm)		Substrate (%)								Cover (%)			
Habitat No.	Type	Characteristics	(m)	(m)	Max	Ave	Silt	Sand	Fine Gravel	Coarse Gravel	Cobble	Boulder	Bedrock	Concrete	Canopy	Instream	Objects	Riparian Vege
1	Run	Run	44	3.5	67	24	20	5	5	5	50	10		5	50	10	10	70
2																		
3																		
Total reach length			44 m															

Appendix Table B-13. Habitat typing immediately downstream of the concrete weir and spillway apron

Stream Habitat Assessment Survey **Date:** March 11, 2015

			Length	Ave Width	Water Depth (cm)		Substrate (%)								Cover (%)			
Habitat No.	Type	Characteristics	(m)	(m)	Max	Ave	Silt	Sand	Fine Gravel	Coarse Gravel	Cobble	Boulder	Bedrock	Concrete	Canopy	Instream	Objects	Riparian Vege
1	MCP	Main channel pool	9.7	3.5	58	30	30	5	5	10	25	25			90	10	0	30
2	SR	Step-run	16.1	3.9	30	18	5	5	5	15	30	40			80	10	0	50
3	MCP	Main channel pool	5	4.1	61	37	5	5	5	15	40	20	10		40	5	0	30
4	LGR	Low gradient riffle	8.1	2.9	27	12	5	5	5	10	30	30	15		30	5	0	40
5	MCP	Main channel plunge pool below spillway	9.1	7.3	~1.5	0.9	5	5	5	15	20	15	35		60	20	10	60
Total reach length			48 m															

Appendix Table B-14. Habitat typing immediately upstream of the weir and concrete channel

Stream Habitat Assessment Survey **Date:** March 11, 2015

			Length	Ave Width	Water Depth (cm)		Substrate (%)								Cover (%)			
Habitat No.	Type	Characteristics	(m)	(m)	Max	Ave	Silt	Sand	Fine Gravel	Coarse Gravel	Cobble	Boulder	Bedrock	Concrete	Canopy	Instream	Objects	Riparian Vege
1	LGR	Low gradient riffle	4.0	3.7	24	12	5	5	5	5	35	45			80	20	5	10
2	MCP	Main channel pool	14.8	4.0	91	46	55	5	5	5	10	20			90	5	5	10
3	HGR	High gradient riffle	11.5	2.6	30	18	10	5	5	5	15	60			90	20	5	50
4	Run	Run	5.2	1.9	15	6	10	10	5	5	20	50			90	5	0	40
5	SR	Step-run	9.8	1.5	24	12	25	5	5	10	40	15			80	5	0	60
6	MCP	Main channel pool	5.5	6.1	40	30	65	5	5	5	10	10			70	5	0	30
7																		
Total reach length			50.8															