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LIST OF FIGURES

1.0 DESCRIPTION OF THE PROJECT/IMPACT SITE

1.1 Responsible Parties

1.1.1 Applicant Responsibilities

The Newhall Land and Farming Company (Newhall Land) is the applicant for the Newhall Ranch Resource Management and Development Plan (RMDP) (Project). The contact person for Newhall Land is Matt Carpenter. Newhall Land or its designee is financially responsible for all costs associated with the implementation, monitoring, maintenance, and long-term management and protection of the mitigation areas, as defined in this document and the *Final Newhall Ranch Resource Management and Development Plan and Spineflower Conservation Plan Joint Environmental Impact Statement and Environmental Impact Report* (Final EIS/EIR; Corps and CDFG 2010) and U.S. Army Corps of Engineers (Corps) permit. However, if Newhall Land transfers ownership of all or part of the RMDP area to another entity, the Corps may agree to substitute the purchaser for Newhall Land as the entity financially responsible for specific mitigation areas. The applicant or its designee is responsible for preparation of site-specific mitigation plans for each development component of the RMDP, and for construction documents. The applicant shall select a qualified biological consultant that possesses the minimum qualifications defined in **Subsection 1.1.2** to implement the mitigation program.

1.1.2 Project Biologist Qualifications and Responsibilities

The applicant shall select and contract a qualified project biologist(s) to implement the mitigation program. The project biologist will possess specific knowledge and project-level experience with wetlands restoration and enhancement projects. The project biologist must demonstrate an understanding of local plant community ecology, habitat restoration, and weed control and have expertise in plant and wildlife identification. The project biologist will possess at least 5 years of wetlands restoration experience in southern California.

The project biologist will perform or oversee the performance of the following items:

- Prepare site-specific mitigation plans as part of construction notification (*i.e.*, sub-notification for California Department of Fish and Game (CDFG) submittal) that specifically address the impacts of individual development components of the RMDP (Dudek 2008);
- Prepare construction documents for each of the mitigation area projects;

- In coordination with Newhall Land and the Corps, review applicable contract documents to gain a complete understanding of each individual project and conduct design review of all subsequent development plans, including subdivision maps, and development construction documents for compliance with the Final EIS/EIR and related environmental permits (*e.g.*, Corps Individual Permit and Section 7 Biological Opinion);
- During design review, recommend language to be modified and/or inserted into development plans, including subdivision maps, and development construction documents, that is designed to increase environmental compliance with permits and programmatic plans;
- Conduct design review of grading plans that include mitigation areas and make specific recommendations for mitigation areas that are consistent with the approved plan to promote mitigation success;
- During development construction, monitor approved development impact limits, site-clearing activities, and salvaging of topsoil and native vegetation to be used in the restoration process;
- Provide technical consultation for interpretation of construction plans for mitigation sites
- Monitor and report on mitigation installation activities to promote compliance with plans, specifications, the approved mitigation plan, and permits;
- Perform 5-year biological monitoring and reporting on each mitigation area consistent with the approved site-specific mitigation plan;
- Review installation and maintenance restoration contractor qualifications.

The project biologist will inform project personnel, prior to implementation of individual development components of the RMDP, of on-site environmental restrictions specific to each individual project site. The project biologist will inform project personnel of the presence or potential presence of special-status species and vegetation communities within or adjacent to the mitigation project areas, as well as known biology-related dangers on site (*e.g.*, rattlesnakes, beehives, stinging nettle). Information about federal, state, and local laws relating to these biological resources will be discussed as part of the personnel education. Access and staging areas outside of environmentally sensitive areas will be established.

The project biologist will periodically monitor mitigation project activities to confirm and promote compliance with the above requirements. During installation and maintenance, the

project biologist will have the authority to stop work in situations in which biological resources not permitted to be impacted are in imminent danger of impacts. The project biologist shall document in an observation report construction activities relating to the mitigation plan, including any project deficiencies, and shall prepare annual reports and summary progress reports for submittal to the Corps and the applicant.

1.1.3 Restoration Contractor Qualifications and Responsibilities

Restoration installation and maintenance shall be provided by a qualified contractor who has previous experience with habitat restoration in southern California and can demonstrate successful completion of wetland mitigation projects of similar size and vegetation community types. The restoration contractor hired for the 5-year period mitigation maintenance may be separate from the installation contractor.

During the implementation phase, the restoration contractor will be responsible for project installation in accordance with the construction documents, the approved mitigation plan, and resource agency permits. Contractor responsibilities will include, but not be limited to, initial weed treatment(s) and biomass removal; irrigation installation, hook-up, and system start-up; seed mix installation; container plant installation; mulch installation; erosion control; grading/contouring; soil amending and preparation; and other tasks as required by the site-specific mitigation plan, construction documents, and resource agency permits. During the 5-year monitoring phase, the restoration contractor will be responsible for maintenance and operation of the irrigation system, weed control, erosion control, trash removal, access control, remedial actions (such as replanting) as deemed necessary to project success by the project biologist, and other tasks as directed by the project biologist and as described in construction documents. The restoration contractor's responsibility will continue until success criteria have been met, pursuant to resource agency permits and the site-specific mitigation plan.

1.2 Location of Project

The RMDP area is located in the Santa Clara River Valley in unincorporated northwestern Los Angeles County (County) and northeastern Ventura County (Figure 1, Regional Location, and Figure 2, Project Vicinity). The RMDP area lies west of Interstate 5 (I-5) and largely southwest of the junction of I-5 and State Route 126 (SR-126), with portions of the RMDP area located in San Martinez Grande and Chiquito canyons north of SR-126. Site elevations range from 825 feet above mean sea level in the Santa Clara River bottom at the Ventura County/Los Angeles County line to approximately 3,200 feet above mean sea level on the ridgeline of the Santa Susana Mountains along the southern boundary (Figure 2).

The RMDP study area encompasses the area covered by the previously approved Newhall Ranch Specific Plan, additional traffic/utility infrastructure related to the Specific Plan, and the Salt Creek area in Ventura County, adjacent to the Specific Plan area. The study area is depicted on Figure 3, RMDP Study Area, along with proposed open space designations and development areas. The sensitive biological areas within this study area encompass the Specific Plan's River Corridor Special Management Area/Significant Ecological Area (SMA/SEA) 23, High Country SMA/SEA 20, Salt Creek area, Open Area,[1] and oak resources.

1.3 Summary of Overall Project

The RMDP is a conservation, mitigation, and permitting plan for the long-term management of special-status biological resources within the 13,651-acre RMDP area. It also directs development in the study area, which would consist of infrastructure in or adjacent to the Santa Clara River and tributaries that are needed to implement the Specific Plan approved by Los Angeles County in May 2003. The RMDP infrastructure includes various flood control features, bridges/road crossings, stream bank stabilization, drainage facilities, roads, building pads, utility corridors, pipeline and utility river crossings, nature trails, the discharge outfall for the previously approved Newhall Ranch Water Reclamation Plant (WRP), and drainage facility maintenance activities. Implementation of this mitigation plan would be phased concurrently with the development plan components of the RMDP.

Construction of proposed infrastructure and required maintenance activities under the RMDP may require permits, agreements, and authorizations from the Corps, U.S. Fish and Wildlife Service (USFWS), and CDFG because the proposed activities would affect waters, riverbeds, or banks within the jurisdictional limits of the Corps and CDFG and may affect species listed as threatened or endangered under the state and/or federal Endangered Species Act(s).

[1] Open Area is a land use designation, which includes a total of approximately 3,420 acres outside of the SMAs, including 1,921 acres that would be preserved to protect significant resources. The Open Area designation includes community parks, prominent ridges, bluffs, slopes, creek beds, and utility and trail system easements and will often function as a transition between development areas and the SMAs. Within the RMDP, the Open Area includes portions of Potrero Canyon, Humble Canyon, Lion Canyon, San Martinez Canyon, and Chiquito Canyon, as well as areas adjacent to Potrero Mesa, Grapevine Mesa, and Airport Mesa. These areas are known to support a variety of special-status species.

FIGURE 1

Draft Mitigation and Monitoring Plan For Impacts to Waters of the US for the Newhall Ranch RMDP

Regional Location

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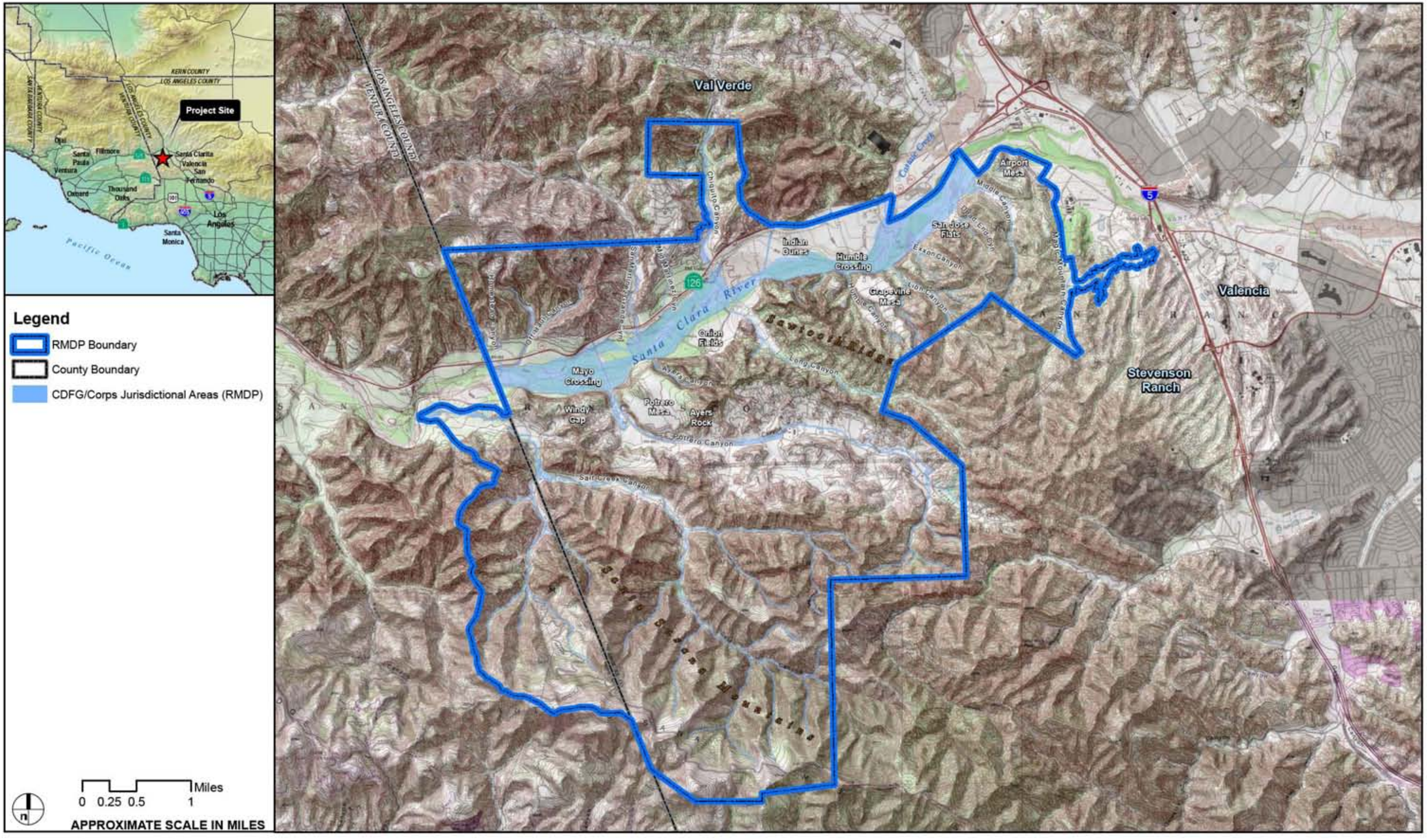

FIGURE 2

Draft Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch Resource Management and Development Plan

Project Vicinity

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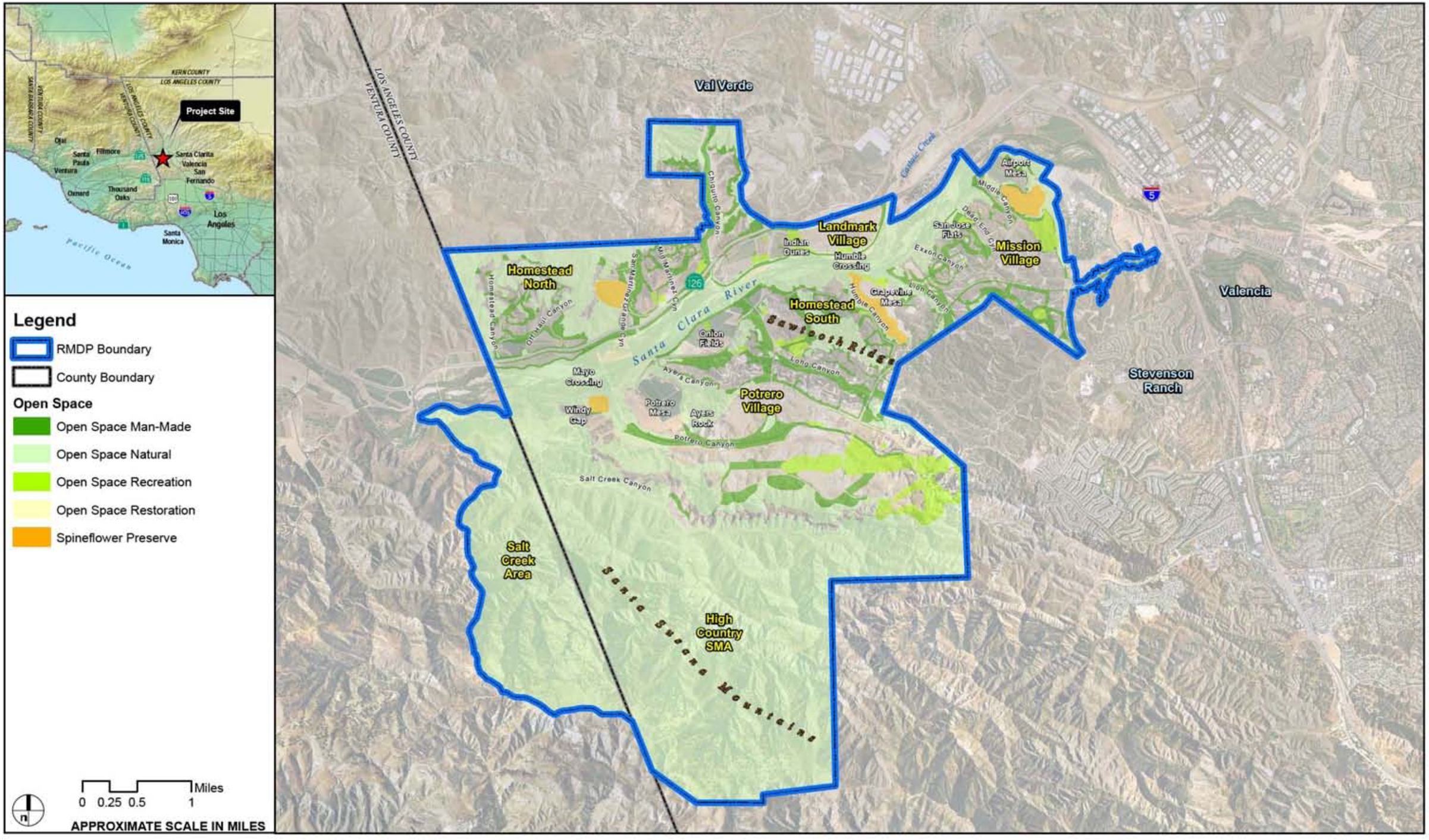

FIGURE 3

Draft Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch Resource Management and Development Plan

RMDP Study Area

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1.3.1 Mitigation Documents and Approval Process

This mitigation plan (Plan) addresses permanent and temporary impacts to jurisdictional waters of the United States associated with the proposed construction of projects associated with the Specific Plan area and provides a program of compensatory mitigation for those impacts. This Plan is intended to be a comprehensive programmatic document that defines the overall mitigation approach and identifies mitigation areas to satisfy Corps permit requirements. This Plan demonstrates that sufficient mitigation opportunities are present within the RMDP area to fully mitigate project impacts associated with the build-out of the Specific Plan area under the RMDP. As such, this Plan is based on the Draft Least Environmentally Damaging Practicable Alternative (LEDPA) described in the Draft 404(b)(1) Alternative Analysis and **Section 5.0** of the Final EIS/EIR. Discussions of project impacts are based on the draft LEDPA identified in the Final EIS/EIR and may be revised prior to final Record of Decision by the Corps and subsequent issuance of a Corps' 404 permit.

If the Draft LEDPA were implemented, a long-term Clean Water Act (CWA) section 404 permit and Master Streambed Alteration Agreement would be issued authorizing the improvements identified in **Subsection 2.1.1** of the Final EIS/EIR. These authorizations would allow the construction of bank stabilization, bridges, grade control structures, utility crossings, and the WRP outfall, and the grading of certain drainages to accommodate building pads.

Under the Draft LEDPA, infrastructure would be constructed in and adjacent to the Santa Clara River and tributary drainages within the Project area. The Draft LEDPA proposes one bridge, Long Canyon Road bridge, and one previously approved bridge, Commerce Center Drive bridge, across the main stem of the Santa Clara River. The Potrero Canyon Road bridge would be eliminated under the Draft LEDPA.

Total impacts to waters of the United States consist of 66.3 acres of permanent impacts, of which 7.7 acres are wetlands, and 32.2 acres of temporary impacts, of which 11.4 acres are wetlands. Buried bank stabilization would be installed in upland and riparian areas along approximately one-half of the north bank (18,811 linear feet (lf)) and one-third of the south bank (7,728 lf) of the Santa Clara River. A total of 35 storm drain outlets would be installed along the river: 25 along the north bank and 10 on the south bank. The WRP outfall to the Santa Clara River also would be constructed. Geofabric bank protection for the utility corridor would be installed on the north side of the Santa Clara River between San Martinez Grande Canyon and Chiquito Canyon.

Overall, the Draft LEDPA would preserve 131,769 lf of on-site drainages, which is 54% of the total 242,049 lf of jurisdictional drainages on the Project site. The Draft LEDPA would modify 54,001 feet of on-site tributaries, convert 56,291 lf of tributary channel to buried storm drain, install 69,913 lf of bank stabilization, and provide three bridges over tributaries and thirteen culvert road crossings over tributaries.

Under the Draft LEDPA, Newhall will create at least 66.3 acres of compensatory mitigation, of which at least 7.7 acres are wetlands. In addition, Newhall will restore 32.2 acres of temporarily impacted waters of the United States.

Five tentative maps are planned to be submitted over a period of time: Landmark Village, Mission Village, Homestead Village North, Homestead Village South, and Potrero Village. Numerous infrastructure components may be proposed as part of tentative map submittals or as individual projects. Likewise, the tentative map areas may be subdivided into phases and submitted separately. This Plan assumes that each of the five tentative maps includes all infrastructure within the map area and that each map is submitted separately in the sequence listed above. The sequence of particular development projects and mitigation areas could change, but the overall approach to mitigation would remain consistent with that outlined in this document.

For each development, a construction notification request (*i.e.*, sub-notification agreement for CDFG submittal) would be submitted to the County and the Corps to demonstrate compliance with design criteria and mitigation measures. With regard to mitigation measures discussed in this Plan, the construction notification request would include a calculation of impacts, mitigation requirements, and proposed mitigation, as well as exhibits and planning documents illustrating how mitigation would be successfully implemented. These planning documents include habitat and/or species restoration plans, a short-term monitoring and maintenance program until habitat/species are established, details regarding the implementation of a 20-year geomorphic monitoring program for tributary channels and channel structures (Phillip Williams Associates (PWA) 2008), and land preservation exhibits with accompanying easement documents and management funding sources.

Individual construction notification requests shall include applicable site-specific mitigation plans. The site-specific mitigation plans would be consistent with this Plan and largely follow the Corps Guidelines for Mitigation and Monitoring Plans in structure and content (Corps 2004). The site-specific mitigation plan shall incorporate the approved development plan impacts and detailed information that describes the mitigation approach to the specific mitigation site. Site-specific mitigation plans shall provide assurance that the proposed mitigation design and target functions and values are justified based on anticipated post-project site conditions and

hydrology. The site-specific plan shall be subject to the approval of the Corps as part of the overall construction notification. Upon receipt of a construction notification request, the Corps would first determine whether the activity is covered by the CWA section 404 permit. If the activity is not covered, the applicant could request that the Corps amend the permit to include the activity after the Corps completes any necessary additional environmental review pursuant to Corps regulations and the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*). If the activity is covered, the Corps would determine whether the avoidance, minimization, and compensation measures identified in the authorization request comply with the terms and conditions of the CWA section 404 permit. If the Corps determines that the proposed activity complies with the terms and conditions of the CWA section 404 permit, a notice to proceed would be issued to the applicant.

1.4 Existing Conditions

The existing conditions within the RMDP study area are described in detail within the Final EIS/EIR (Corps and CDFG 2010). Figures 4A through 4G, Existing Conditions of RMDP Site, depict the existing conditions.

1.4.1 Field Reconnaissance

Vegetation maps of the RMDP study area were used in the field to identify potential mitigation areas, opportunities, and constraints. Only areas within the proposed open space/preserve boundaries were evaluated. In general, areas supporting special-status plant species were not considered suitable for mitigation in order to avoid impacts to special-status plants. Dudek habitat restoration specialists Doug Gettinger, Marc Doalson, Scott Boczkiewicz, and Andy Thomson conducted the mitigation potential surveys in the Newhall Ranch High Country SMA and the Salt Creek area on November 7–10, November 14–18, and December 19–21, 2005. In the remaining Specific Plan area, Dudek habitat restoration specialists Doug Gettinger, Jeremy Sison, Mike Sweesy, and Andy Thomson conducted the mitigation potential surveys on August 15–16, 2006.

A list of plant species observed within the Specific Plan area from 2002 to 2006 is presented in Appendix A.

1.4.2 Existing Plant Communities and Land Covers

Vegetation community and land cover classifications used in the Final EIS/EIR generally follow the Vegetation Classification and Mapping Program "List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database" system (CDFG 2003, updated in October 2007 (CDFG 2007)). The vegetation community types, along with their

floristic alliances and associations, and human-dominated land cover types are described below. Where vegetation types observed on site do not conform to the CDFG (2003) vegetation community classification system, they are defined for this Plan based on the dominant plant species. Communities that are recovering from burns were mapped as "burned" associations, and native communities that contain 20% to 50% native species by percent cover were mapped as "disturbed" associations. Areas where native species cover was visually estimated to be less than 20% were mapped as disturbed land. Areas mapped as "agriculture" have been cultivated or are in cultivation. Areas mapped as "developed" represent paved roads, structures, and other hardscape features. Where a grassland vegetation community was visually estimated to contain 10% or more absolute cover of native perennial grasses (*e.g.*, *Nassella pulchra*), the area was mapped as a native grassland. The 10% threshold is an industry standard for identifying perennial native grasslands (Keeler-Wolf *et al.* 2007). Oak woodland is defined as areas with 20% to 50% cover by oak trees. Oak/grass includes areas where oak trees comprise less than 20% of the total cover.

Fourteen general vegetation community types and three human-dominated land cover types (*i.e.*, active and inactive agriculture, disturbed land, and developed land) were identified in the project area during the field investigations. The descriptions in Table 1 are organized by general vegetation community type, floristic alliance (as applicable), and association (as applicable).

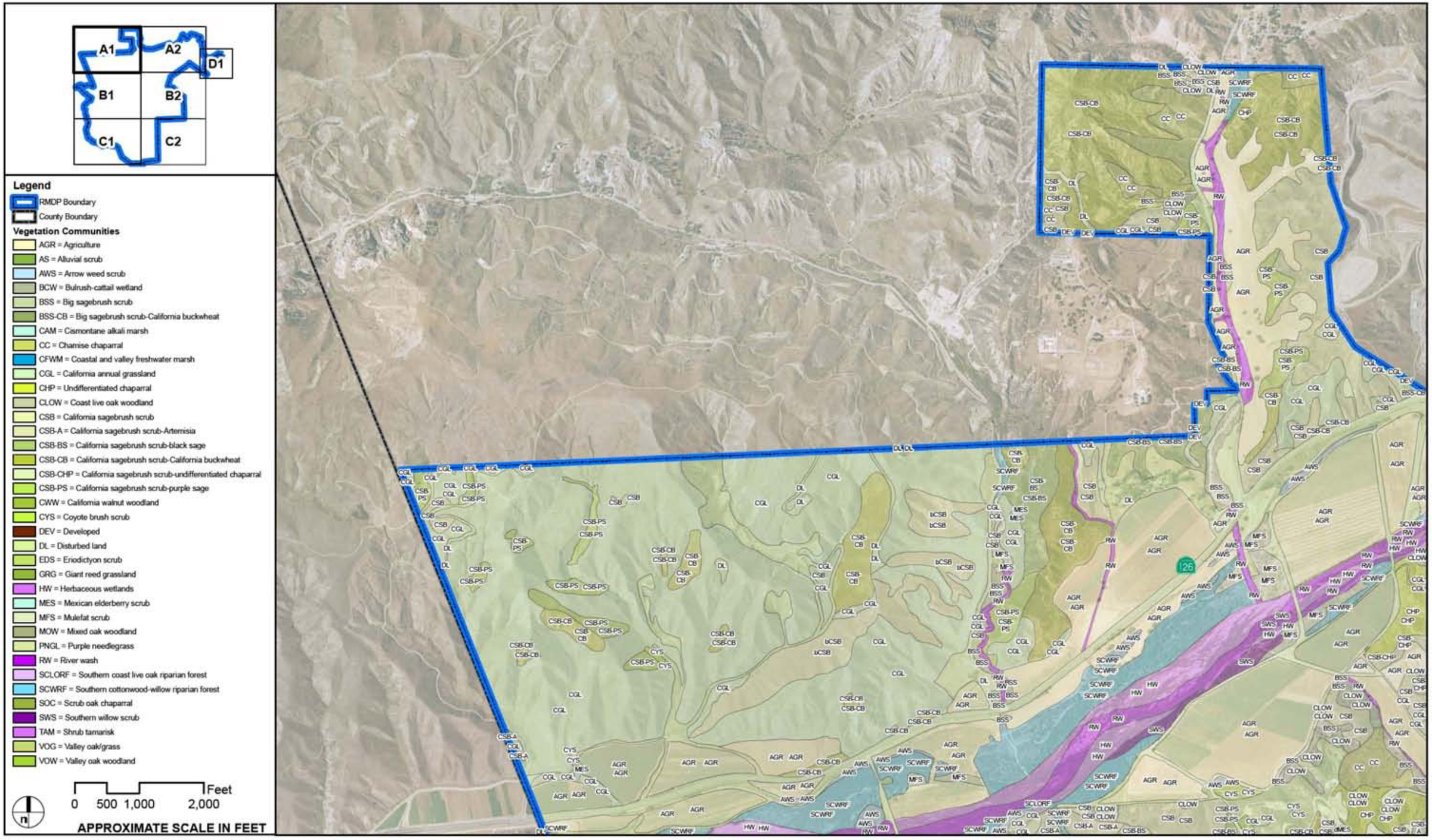

FIGURE 4A

Draft Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch Resource Management and Development Plan

Existing Conditions of RMDP Site

Z:\Projects\j37380\RMDP\arcmap\RMDP_Conceptual_Wetlands_Mitigation_Plan\Figure 4A RMDP Existing Conditions.mxd

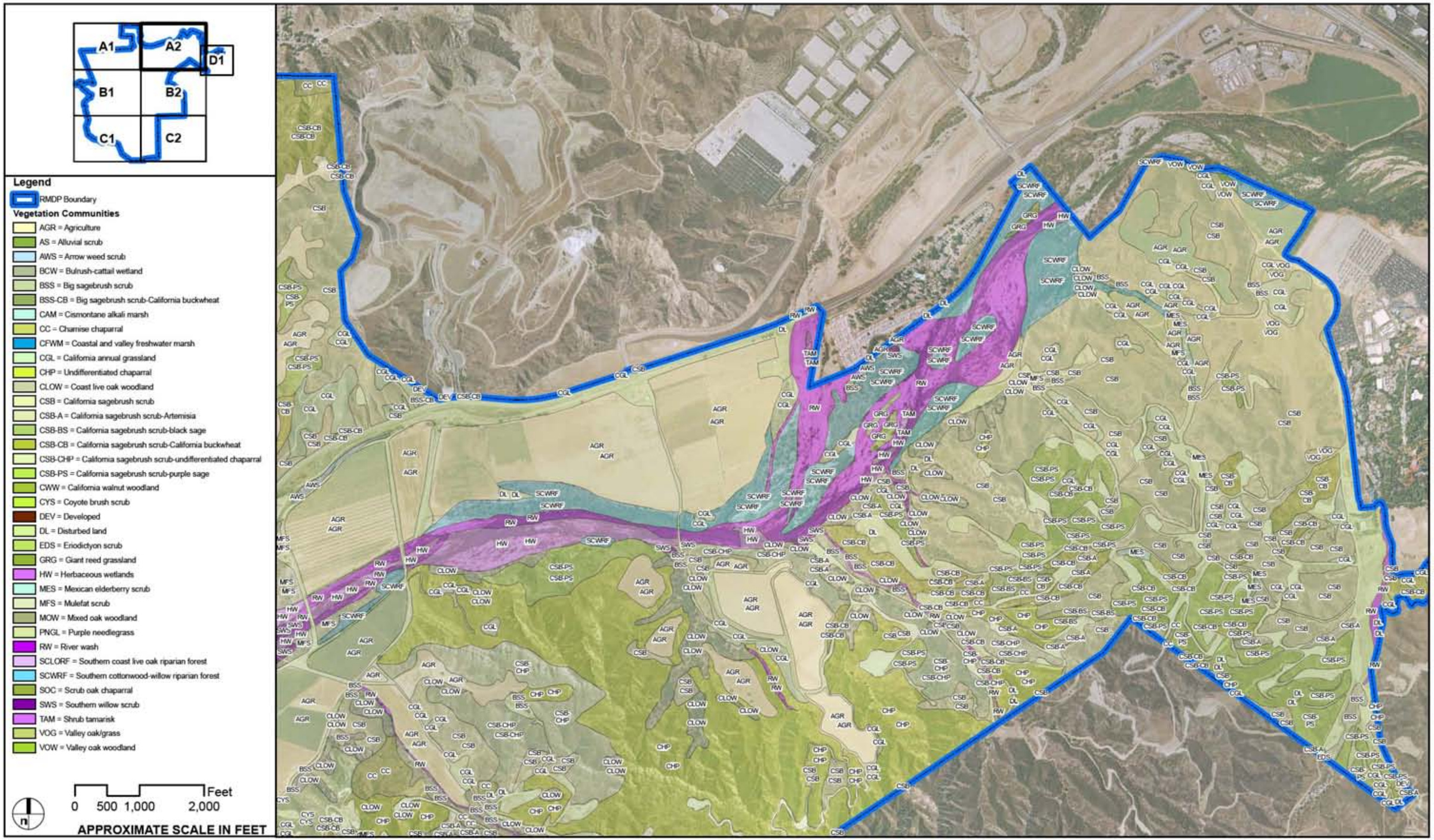

FIGURE 4B

Draft Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch Resource Management and Development Plan

Existing Conditions of RMDP Site

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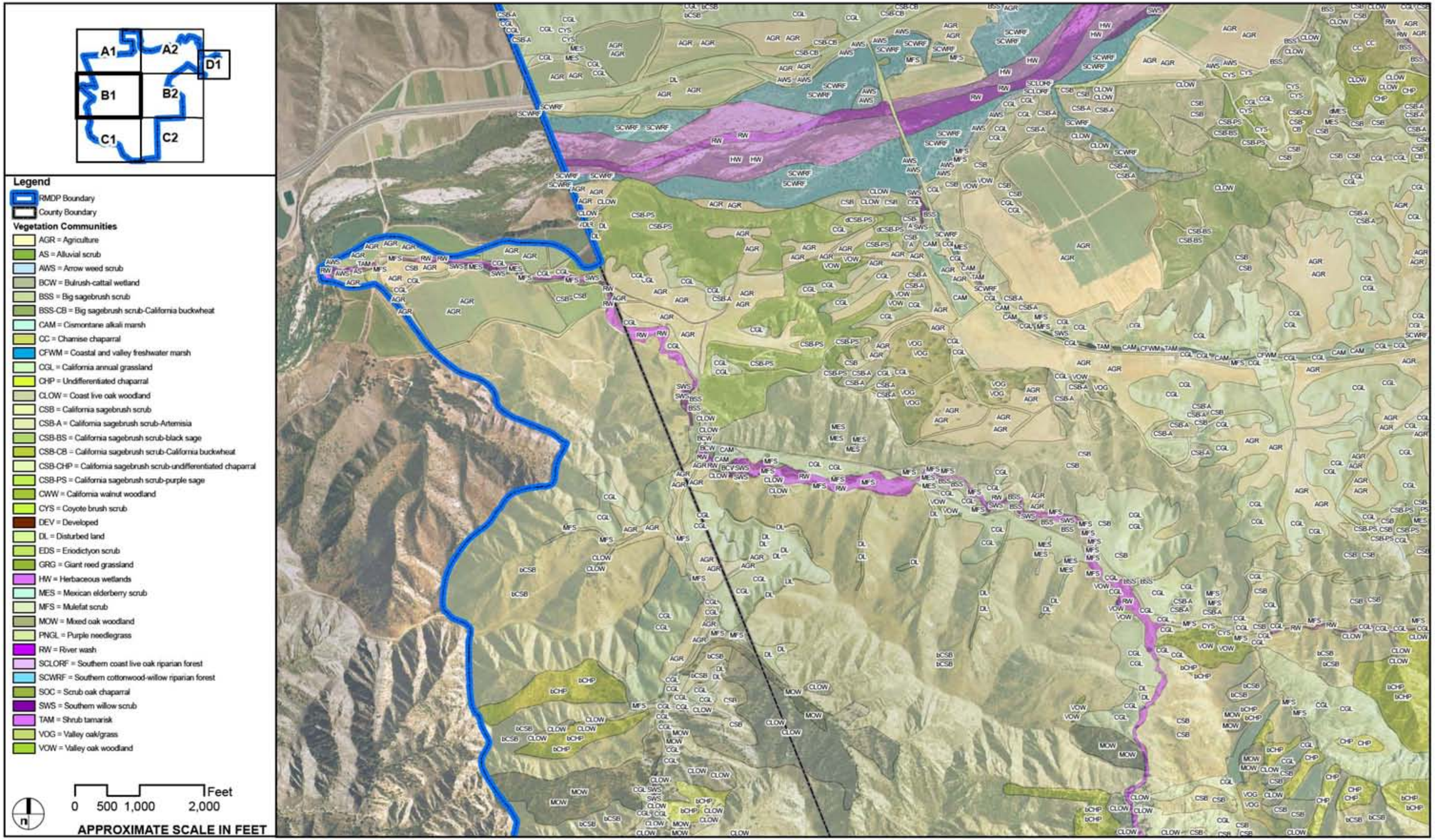

FIGURE 4C

Draft Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch Resource Management and Development Plan

Existing Conditions of RMDP Site

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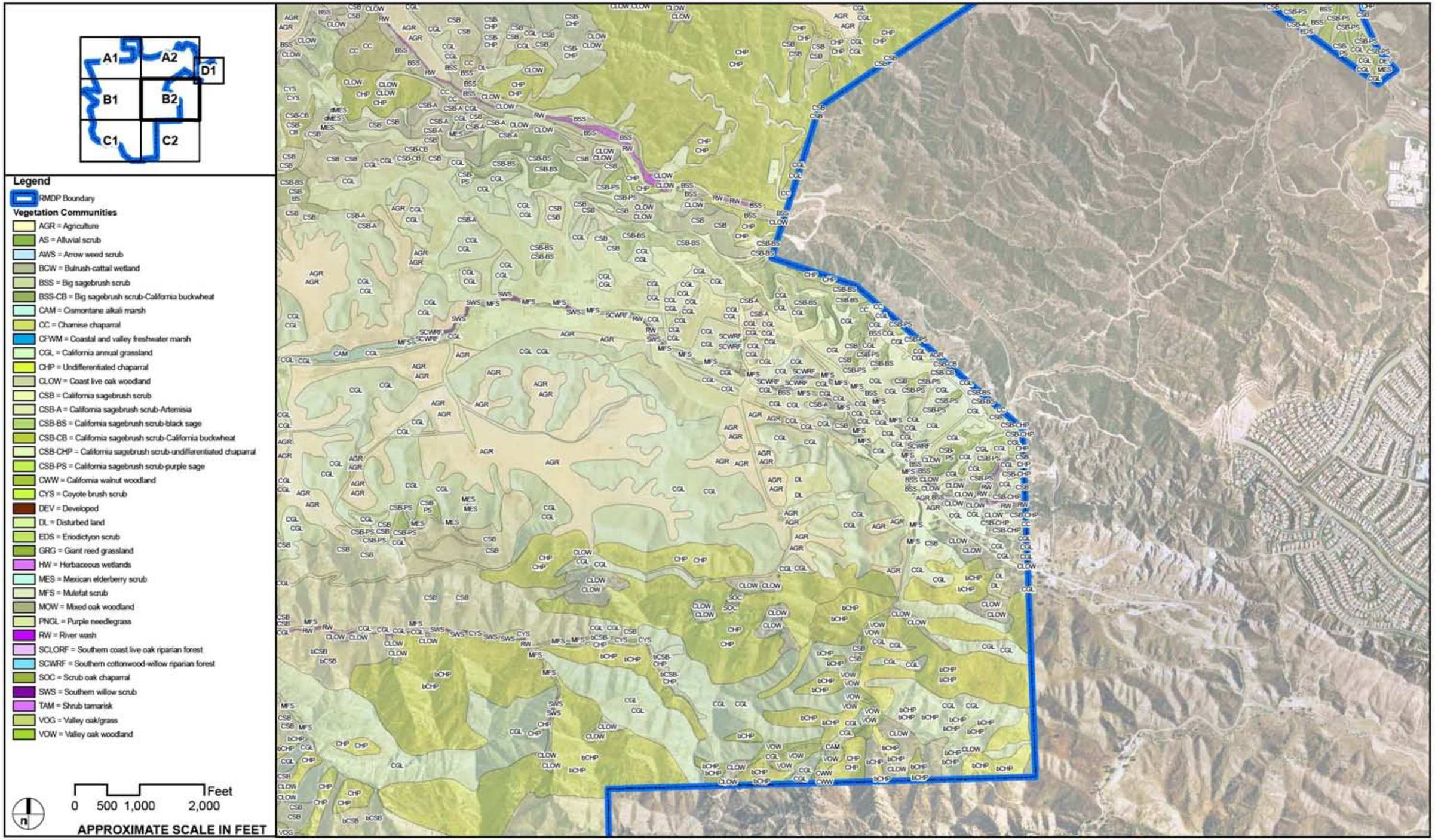

FIGURE 4D

Draft Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch Resource Management and Development Plan

Existing Conditions of RMDP Site

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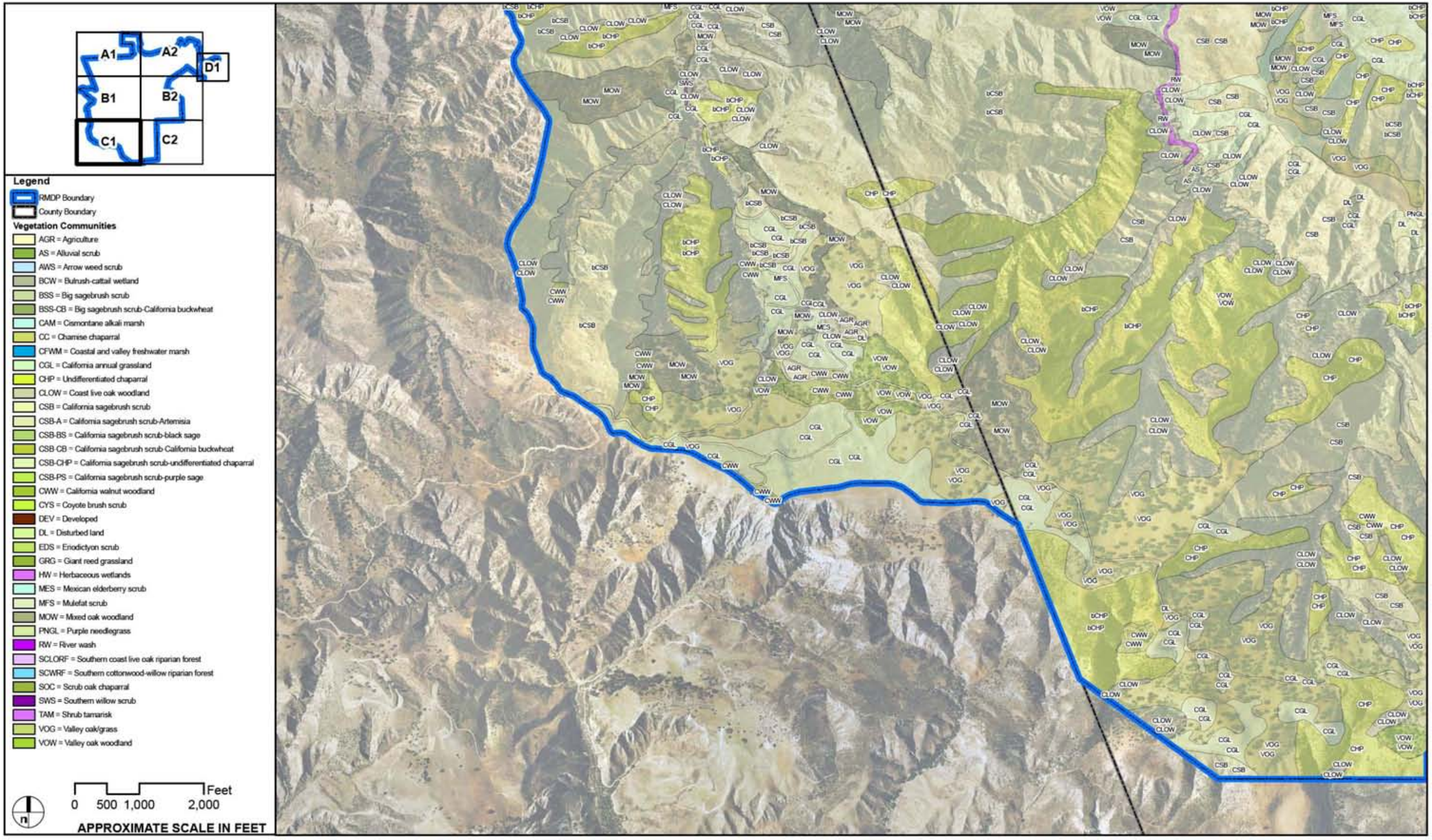

FIGURE 4E

Draft Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch Resource Management and Development Plan

Existing Conditions of RMDP Site

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FIGURE 4F

Draft Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch Resource Management and Development Plan

Existing Conditions of RMDP Site

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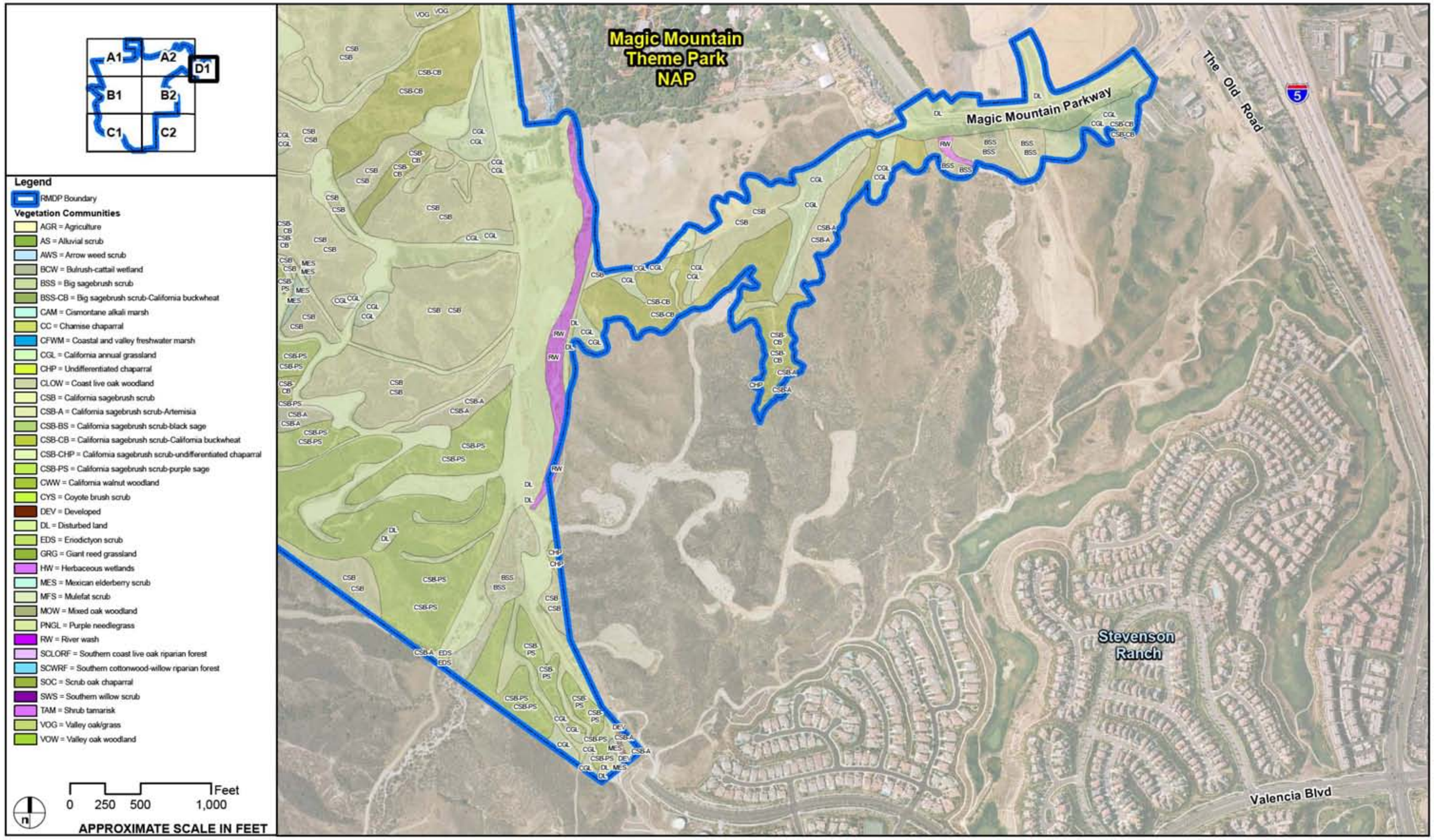

FIGURE 4G

Draft Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch Resource Management and Development Plan

Existing Conditions of RMDP Site

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Table 1

Existing Vegetation Communities, Floristic Alliances and Associations, and Land Cover Types in Project Area

General Physiognomic and Physical Location	General Habitat Type	Floristic Alliance	Association	RMDP Acreage
Grass and Herb Dominated Communities	Non-Native Grassland	California annual grassland	Not mapped to association level	2,175.5
	Native Grassland	Purple needlegrass	Not mapped to association level	0.6
Scrub and Chaparral	Coastal Scrub	California sagebrush scrub	Not mapped to association level	1,529.3
			Burned California sagebrush scrub	1,469.3
			California sagebrush–*Artemisia californica*	82.5
			California sagebrush–purple sage	393.5
			Disturbed California sagebrush–purple sage	4.5
		California sagebrush–black sage scrub	California sagebrush–black sage	196.3
		California sagebrush–California buckwheat scrub	Not mapped to association level	310.0
		California sagebrush scrub–undifferentiated chaparral	Not mapped to association level	135.0
			Burned California sagebrush scrub–undifferentiated chaparral	5.2
		Coyote brush scrub	Not mapped to association level	9.2
	Undifferentiated Chaparral Scrubs	Not mapped to alliance level	Not mapped to association level	1,106.9
			Burned undifferentiated chaparral	957.2
	Chaparral with Chamise	Chamise chaparral	Not mapped to association level	55.7
			Burned chamise chaparral	0.0
	Chaparral with Oak	Scrub oak chaparral	Not mapped to association level	1.5
	Other Scrubs	Eriodictyon scrub	Not mapped to association level	0.2
Broad Leafed Upland Tree Dominated	Upland Walnut Woodland and Forest	California walnut woodland and forest	California walnut woodland	27.2
	Oak Woodland and Forest	Coast live oak forest and woodland	Coast live oak woodland	757.8
		Mixed oak woodland and forest	Not mapped to association level	168.9
		Valley oak forest and woodland	Valley oak woodland	79.4

Table 1 (Continued)

General Physiognomic and Physical Location	General Habitat Type	Floristic Alliance	Association	RMDP Acreage
			Valley oak/grass	461.4
Bog and Marsh	Marsh	Bulrush–cattail wetland	Not mapped to association level	1.4
		Cismontane alkali marsh	Not mapped to association level	18.6
		Fresh–brackish water marsh	Coastal and valley freshwater marsh	2.0
Riparian and Bottomland Habitat	Other Riparian/Wetland	Herbaceous wetland	Not mapped to association level	183.1
		River wash	Not mapped to association level	290.0
		Alluvial scrub	Not mapped to association level	1.0
		Big sagebrush scrub	Not mapped to association level	76.5
		Big sagebrush scrub	Big sagebrush-California buckwheat	0.5
		Giant reed	Not mapped to association level	5.6
	Low to High Elevation Riparian Scrub	Arrow weed scrub	Not mapped to association level	18.7
		Mexican elderberry	Not mapped to association level	12.8
		Mexican elderberry	Disturbed Mexican elderberry	0.3
		Mulefat scrub	Not mapped to association level	71.5
	Riparian Forest and Woodland	Southern willow scrub	Not mapped to association level	22.7
		Tamarisk scrub and woodland	Shrub tamarisk	2.8
		Coast live oak forest and woodland	Southern coast live oak riparian forest	0.7
		Fremont cottonwood riparian forest and woodland	Southern cottonwood–willow riparian	358.3
Man-Made Land Cover Types		Agriculture	NA	1,576.4
		Developed land	NA	0.5
		Disturbed land	NA	1,080.6
			Total	**13,651.1**

1.4.3 Soils

Soils present on the RMDP site include:

Anacapa sandy loam, 2% to 9% slopes
Badland
Castaic–Balcom complex, 30% to 50% slopes, eroded
Castaic–Balcom complex, 50% to 65% slopes, eroded
Castaic and Saugus soils, 30% to 75% slopes, eroded
Castaic–Balcom silty clay loams, 9% to 15% slopes
Castaic–Balcom silty clay loams, 15% to 30% slopes
Castaic–Balcom silty clay loams, 30% to 50% slopes
Castaic–Balcom silty clay loams, 30% to 50% slopes
Castaic–Balcom silty clay loams, 50% to 65% slopes
Castaic and Saugus soils, 30% to 65% slopes, severely
Chino loam
Cortina sandy loam, 0% to 2% slopes
Garretson loam, 2% to 9% slopes
Gaviota rocky sandy loam, 15% to 30% slopes, eroded
Gaviota rocky sandy loam, 30% to 50% slopes, eroded
Garretson gravelly loam, 2% to 9% slopes
Gazos clay loam, 30% to 50% slopes
Gaviota rocky sandy loam, 15% to 50% slopes
Gazos silty clay loam, 30% to 50% slopes
Hanford sandy loam, 0% to 2% slopes
Hanford sandy loam, 2% to 9% slopes
Landslides
Metz loamy sand, 0% to 2% slopes
Metz loamy sand, 2% to 9% slopes
Metz loam, 2% to 5% slopes
Mocho loam, 0% to 2% slopes
Mocho loam, 2% to 9% slopes
River wash
Sandy alluvial land
Saugus loam, 30% to 50% slopes
Saugus loam, 30% to 50% slopes, eroded
Sorrento loam, 0% to 2% slopes

Sorrento loam, 2% to 5% slopes
Sorrento loam, 2% to 9% slopes
Terrace escarpments
Yolo loam, 0% to 2% slopes
Yolo loam, 2% to 9% slopes
Zamora loam, 2% to 9% slopes
Zamora loam, 9% to 15% slopes
Yolo loam, 0% to 2% slopes.

In general, soils on the RMDP site are characterized by moderately deep to very deep soils that are moderately well drained to excessively well drained. Parent material consists of sedimentary rocks (*e.g.*, sandstone, shale, and mudstone), granite, and alluvium. Two soil types are defined as farmland of statewide importance: Cortina sandy loam and Sorrento loam; and eleven soil types are defined as prime farmland, if irrigated: Anacapa sandy loam, Chino loam, Garretson loam, Garretson gravelly loam, Hanford sandy loam, Metz loamy sand, Metz loam, Mocho loam, Sorrento loam, Yolo loam, and Zamora loam (2% to 9% slopes). Prime farmland ranges from 0% to 9% slopes throughout the RMDP area. Slopes range from 0% to 75% throughout the RMDP area. In low-lying areas, the erosion hazard is slight to moderate, and the runoff rate is slow to medium. On the steeper slopes, the erosion hazard is moderate to very high, largely dependent on slope steepness (USDA 1969).

1.4.4 Geomorphic Conditions and Riparian Resources of the Santa Clara River

As described in **Section 4.1**, Surface Water Hydrology and Flood Control of the Final EIS/EIR, the Project area is located within the Santa Clara River watershed, which drains an area of approximately 1,624 square miles in the Transverse Mountain Ranges of southern California. Elevations within the watershed range from sea level at the river mouth to 8,800 feet at the summit of Mount Pinos in the northwest corner of the watershed. The Santa Clara River flows generally from east to west from its headwaters near Acton to the Pacific Ocean near the City of Ventura, approximately 40 miles downstream of the Newhall Ranch Specific Plan subregion. The Santa Clara River transects the northern portion of the Project area from east to west.

The Santa Clara River is perennial from the existing Valencia WRP, downstream to approximately 3.5 miles downstream of the Los Angeles County/Ventura County line (western limit of the Project boundary) near Rancho Camulos. Flows in the Santa Clara River also can be affected by groundwater dewatering operations or by diversions for agriculture or groundwater recharge. Throughout the Santa Clara River channel, complex surface water/groundwater interactions lead to areas of alternating gaining and losing river segments (PWA 2008).

The existing floodplain generally consists of a natural alluvial river system and has multiple channels (braided channels) within and adjacent to the Newhall Ranch Specific Plan area. Bed material in the Santa Clara River is mostly composed of non-cohesive sands and gravels. Bank erosion is due to flow impinging upon the banks. This kind of system is characterized by high sediment loads, high bank erodibility, and intense and intermittent runoff conditions. Combined with the relatively flat gradient of the river through the Project area (average slopes range from 5% to 0.5%), it has a high potential to aggrade (deposit sediment) at low velocities.

The diversity of habitat conditions in the Santa Clara River at any one time supports a variety of aquatic invertebrates, aquatic plants, and fishes. The density, biomass, and location of vegetation in relation to the channel bottom are directly dependent upon the frequency of disturbance by flood flows. Successional mulefat scrub occupies the active channel and is disturbed annually by flows. Channel-bottom habitat also includes all aquatic features, such as pools and flowing water, as well as most of the emergent wetlands in the River corridor, because of the presence of water. In contrast, mature riparian forests are located above the active river channel and are only flooded during infrequent storm events, allowing large trees to become established between events.

Stands of vegetation are eroded by high flows, and newly vegetated areas are created where vegetation becomes established by seeds or buried stems. Often during high flows, new sandbars are formed and old ones are destroyed. High flows can also change the alignment of the low-flow channel as well as the number and location of aquatic habitats of the river. In high-flow years, wetland vegetation along the margins of the low-flow channel and pools may increase. In high-flow years, this vegetation would be removed but would likely become reestablished during the spring and summer by natural colonization processes (PWA 2008).

1.4.5 Geomorphic Conditions and Riparian Resources of the Tributary Drainages

PWA (2008) conducted an assessment of existing geomorphic conditions and riparian resources to characterize channel conditions of five primary tributary basins within the Project area. Overall, the three tributaries on the south side of the Santa Clara have certain common characteristics, as do those on the north side:

- South side tributaries (Lion, Long, and Potrero) are characterized by small watershed areas (1.5 to 5 square miles); steep channel slopes (2% to 5%); very high watershed sediment supply (resulting in channel aggradation, even with steep slopes); and unstable

channels (with actively migrating headcuts). The Draft LEDPA would impact most of the watershed areas in these tributaries.

- The north side tributaries (Chiquito and San Martinez Grande) have somewhat larger watersheds (3 to 5 square miles) with a majority being upstream of the Project area boundary. They are more deeply incised in the lower reaches, convey large amounts of sand, and discharge as alluvial fans on the Santa Clara River floodplain. Flows from these drainages are conveyed under SR-126 to confluence with the Santa Clara River immediately downstream. The Draft LEDPA would impact only the lower reaches and a smaller percentage of the total watershed area in these tributary drainages.

In general, the tributaries are ephemeral or highly intermittent in nature and do not support perennial flows. Perennial tributary drainages include lower Potrero Canyon and portions of Salt Creek Canyon. Discharge from the Middle Canyon spring is also perennial and supports riparian habitat along the southern bank of the Santa Clara River, just downstream from the confluence with Middle Canyon.

According to PWA (2008), the geomorphology of the active tributaries to the Santa Clara River within the Project area are generally characterized as highly variable and sinuous alignments reflective of the influence of the physical and topographic features. There is also a high degree of variation of the active channel geometry (*i.e.*, width and depth) along these relatively short channel reaches. In general, the active portions of the creeks are more deeply incised below the canyon valley floors. The floodplains are generally entirely contained within the active creek banks, and there is little over-bank flow. The changes in creek geometry and form may indicate influences from the upper watersheds that affect the sediment delivery. The change in channel geometry is also reflected in coincidental variations of the streambed slopes (*i.e.*, the slope variations are generally higher in the contractions of the channel geometry and flatter in the expansion areas, upstream and downstream) (PWA 2008). The following excerpts are taken from the geomorphology study prepared by PWA to describe the specific conditions of the tributary channels (PWA 2008):

> **Chiquito Canyon.** Chiquito Canyon has a watershed area of 4.9 square miles at the downstream project limit and drains south into the north bank of the Santa Clara River. The watershed is currently used for a combination of cattle grazing, and residential and commercial land uses within the community of Val Verde located immediately upstream of the Project area. Chiquito Canyon enters the project area in a confined reach with very

high, unstable banks[2]. Further downstream it exits its confined canyon and enters a long reach that is dominated by a series of large alluvial fans on the east bank. These fans are supplying abundant sand to the creek and the channel has formed low banks in the toe of the fan that have little erosion resistance, in part due to the arable land use and lack of woody vegetation. As a result this reach is aggrading and widening. Further downstream the channel becomes slightly incised as it cuts through the alluvial fans, leaving abandoned terraces on the banks that are actively eroded on outside bends. Towards the downstream end of the canyon, the channel remains slightly confined and has been modified by a series of bridges and culverts. In places these appear to cause local backwaters and sediment deposition (Final EIS/EIR, **Appendix 4.2**).

The portion of the Chiquito Canyon drainage within the RMDP site follows a mildly sinuous pattern within long, linear meanders reflecting the influences of the physiographic features along the valley floor. The active channel is incised in the lower 2,500 feet upstream from the SR-126 roadway crossing, while the remainder has developed a shallower active channel and wider drainage area. The hydraulics along this portion of the stream area also are influenced by two different existing roadway crossing locations within the RMDP area that include SR-126, a local access roadway arch crossing, and the Chiquito Canyon Road crossing. Detailed hydraulic modeling of the existing floodplain was performed by PACE. The modeling indicated that a major portion of the Chiquito Canyon floodplain was hydraulically "steep" (Froude numbers greater than a value of 1.0 which indicates supercritical flow conditions) with an average streambed slope of the channel of approximately 2.39 percent. (PACE, 2008B; see **Appendix 4.1**.)

San Martinez Grande Canyon. San Martinez Grande Canyon has a watershed area of 3.6 square miles and drains south into the north bank of the Santa Clara River. The watershed is currently used for a combination of cattle grazing, rural residential, and industrial (oil and gas) land uses. San Martinez Grande Canyon combines a series of reaches alternating between unconfined stable reaches with small inset floodplains and aggradational conditions with actively eroding outside bends. The upper reach has a well defined and relatively stable bankfull channel that contains the 5-year flow adjacent to a small inset floodplain. Downstream the channel is wider and many outside bends are actively eroding into relict raised floodplain terraces, creating failing banks. Downstream

[2] Confinement refers to the valley/canyon width. If the valley width is narrow (confined), then lateral migration of the channel is limited and the channels are typically less-sinuous with limited floodplain area. If the valleys are wide (unconfined), then there is typically greater lateral migration, sinuousity, and potentially braiding.

of this reach the valley widens and the channel becomes more stable with small floodplains[3] that persist towards the downstream end of the channel.

Detailed hydraulic modeling of the existing floodplain was performed by PACE (2008B). The modeling indicated that approximately 50 percent of the lower reach of the San Martinez Grande Canyon floodplain was hydraulically "steep," (Froude numbers greater than a value of 1.0 which indicates supercritical flow conditions) while the remainder of the canyon, primarily the upper portion to the RMDP boundary, was hydraulically a "mild" channel (Froude numbers less than a value of 1.0 which indicates subcritical flow conditions). The channel bed slopes range from eight percent in the narrower areas to 0.5 percent in wider, depositional areas. (PACE, 2008B; see Final EIS/EIR, **Appendix 4.1**.).

Lion Canyon. Lion Canyon has a watershed area of 0.8 square mile and drains westerly into the bank of the Santa Clara River. The watershed is currently used for a combination of cattle grazing and oil production. Lion Canyon has steep headwaters (above the project boundary) that supply large amounts of sediment into the aggrading upper reach, producing an undersized, transport-limited channel. Aggradation continues downstream producing a well-connected and vegetated floodplain. There is a short stable reach with mature oaks upstream of another aggradational reach which terminates at an existing culverted road crossing. There is a very sharp transition from aggrading to eroding conditions downstream of the road crossing, which acts as a grade control protecting the upper reaches from headcutting and incision. Downstream of the grade control is a 12-foot high knickpoint (bedrock outcrop) and a reach of deeply incised channel with some failing banks. This reach opens up into a wider section that historically incised material derived from the right hillside (identified by the geotechnical assessment as a former quarry spoil deposit). This material constrained the channel and deflected it to the left bank where it is actively eroding and causing slab failures. Despite the longer-term appearance of incision, the bed shows recent signs of aggradation. Downstream the channel remains historically incised with erosion on the outside bends, local bed aggradation, and the formation of a small new floodplain on the inner bends. The right valley side looking downstream is undercut by the creek, creating a high unstable slope. This reach terminates in an 8-foot-high knickpoint suggesting that the channel is

[3] A floodplain is the area adjacent to a stream channel that consists of sediments deposited during the present hydrologic regime and is inundated with water when the stream overflows its banks. Floodplain connection describes the relationship between the stream and the adjacent floodplain that influences the ability of water to flow into or out of the wetland or to inundate adjacent uplands during high-water periods.

currently eroding the bed sediment deposited in the 2004-05 floods (Final EIS/EIR, **Appendix 4.2**).

The lower portion of the Lion Canyon channel is heavily eroded and the floodplain is disconnected and eroded. Upstream, the channel is relatively stable and well vegetated. The channel is maintaining a relatively steep gradient for a watershed of this size and with a sand bed. One reason for this is the high sediment delivery rate. The principal sediment source appears to be bed and bank erosion of the channel in the lower reaches, and a combination of channel and headwall erosion in the upper reaches. The eroding gullies that extend up into the canyon walls in many locations are an additional source of sediment. Generally, the existing geomorphic conditions in Lion Canyon are unstable and channel degradation is ongoing due to excessive erosion and headcutting below existing road crossings.

The modeling of the existing floodplain performed by PACE (2008B) indicated that approximately 50 percent of the lower reach of the Lion Canyon floodplain was hydraulically "steep," (Froude numbers greater than a value of 1.0 which indicates supercritical flow conditions) while the remainder of the canyon, primarily the upper portion of the RMDP area boundary, was a hydraulically "mild" channel (Froude numbers less than a value of 1.0 which indicates subcritical flow conditions). The average overall mean slope of the channel from the upper head waters to the canyon mouth is 4.6 percent. (PACE, 2007.)

Long Canyon. Long Canyon has a watershed area of 2.0 square miles at the downstream project limit and drains westerly into the south bank of the Santa Clara River. The watershed is currently used for a combination of cattle grazing and oil production. Long Canyon is characterized by a very steep, unstable headwaters reach (outside the Project area) that becomes aggradational downstream. Most of the canyon is then moderately aggradational to moderately stable with some sections of wide floodplain, before passing though a culvert and into a constructed earth channel (agricultural ditch) that conveys it to the Santa Clara River. The upstream headwaters reaches are deeply incised and highly unstable, with actively eroding channels and very high rates of sediment delivery. Downstream the channel gradient flattens and the excess sediment (presumed to be from the 2004-05 winter flows) has partially filled the channel. As the channel moves downstream, there are longer reaches of incision, but the most recent events filled in the low-flow channel and bed. The channel passes through a slightly incised reach with recent aggradation before entering a highly aggrading section. The channel then enters a confined reach indicating long-term channel incision but again with local bed aggradation

and actively eroding relict terraces on the outside bend before emerging into another aggrading, unconfined reach with an extensive active floodplain. Downstream the channel is aggrading causing lateral migration into the dirt road creating access to a low floodplain on the opposite side. Further downstream the channel continues to aggrade with eroding outside bends adjacent to relict terraces. The channel passes through a short, relatively stable reach before widening and aggrading. Downstream the channel becomes slightly confined with a higher floodplain on one bank but evidence of aggradation from the proximity to the other floodplain level. Below this point the channel enters a constructed trapezoidal flood channel that conveys it to the Santa Clara River (Final EIS/EIR, **Appendix 4.2**). Generally, the existing geomorphic conditions in Long Canyon are unstable due to active erosion downstream of road crossings and lateral scour caused by inadequate channel capacity to transport heavy sediment loads.

The modeling of the existing floodplain performed by PACE (2008B) indicated that approximately 80 percent of the lower reach of the Long Canyon floodplain was hydraulically "steep," (Froude numbers greater than a value of 1.0 which indicates supercritical flow conditions) while the remainder of the canyon, primarily the upper portion of the Newhall Ranch boundary, was a hydraulically "mild" channel (Froude numbers less than a value of 1.0 which indicates subcritical flow conditions). The average overall slope of the channel from the upper headwaters to the canyon mouth is 3.0 percent. (PACE, 2008B; see **Appendix 4.1**.).

Potrero Canyon. Potrero Canyon has a watershed area of 4.7 square miles and drains westerly into the south bank of the Santa Clara River. The watershed is currently used for a combination of cultivated agriculture, cattle grazing and oil production. Potrero Canyon has steep headwaters with incised, erosive channels that deliver an abundance of relatively coarse sediment to a downstream braided reach. The upper canyon immediately downstream of the steep headwaters appears to be aggradational, as sediment delivery exceeds transport capacity and the surplus sediment is stored in the channel. Downstream there is a short reach where the channel is confined against the valley side and is deeply incised with highly unstable banks. The channel downstream shows signs of previous incision, but there are indications of recent aggradation, partially filling the low flow channel with sediment, which is now being re-eroded and reworked; overall, this creates a highly complex pattern. Downstream, the channel has a long and unusual reach of cismontane alkali marsh much of which takes the form of a swale rather than a well-defined channel. Towards the downstream end, the channel becomes increasingly well defined, culminating in an unstable knickpoint that is migrating upstream. The channel

transitions sharply into a steep, incised section with several knickpoints before emptying into the Santa Clara River. (Final EIS/EIR, **Appendix 4.2**). Generally, geomorphic conditions with Potrero Canyon are relatively unstable due to historic activities (channel re-alignment for agriculture, road crossings). In particular, the channel in the lower canyon is actively eroding and has become deeply incised. Heavy sediment loads in the upper reaches have resulted in lateral channel migration and bank scour. The active channel has limited hydraulic capacity, particularly in the lower portion of the canyon, which results in overtopping and the creation of a secondary sheet flow on the southern side of the canyon, supporting a large meadow area. The engineered portions of the active channel follow the canyon floor. The canyon floor is characterized by a very large and flat width in the valley compared to the other tributary canyon watersheds. The drainage characteristics and trends also reflect a wide, stable valley system, with little tendency to deeply incise beyond the minor active channel.

The modeling performed by PACE (2008B) indicated that approximately 40 percent of the lower reach of the existing Potrero Canyon floodplain was hydraulically "steep," (Froude numbers greater than a value of 1.0 which indicates supercritical flow conditions) while the remainder of the canyon, primarily the upper portion of the RMDP area boundary was a hydraulically "mild" channel (Froude numbers less than a value of 1.0 which indicates subcritical flow conditions). The average overall slope of the channel from the upper headwaters to the canyon mouth is approximately 3.1 percent. (PACE, 2008B; see Final EIS/EIR, **Appendix 4.1**.).

1.5 Jurisdictional Areas to be Filled

Based on the most recent data and field work available, the RMDP project area includes a total of 660.1 acres of waters of the United States, of which 276.9 acres are wetlands and 383.2 acres are non-wetland waters of the United States. The jurisdictional acreages are shown on Table 2, along with the acreage distribution for the largest drainages. Of the total Corps-jurisdictional waters on the site, 471.2 acres (71%) comprise the Santa Clara River corridor, and the remaining portion represents tributaries to the Santa Clara River. The smallest, ephemeral drainages on site have been combined into a single heading ("Other Drainages within RMDP site") and have jurisdictional area totaling 34.4 acres (5% of total Corps-jurisdiction on the RMDP site). A preliminary jurisdictional determination also has been prepared and is included in **Appendix F4.6** of the Final EIS/EIR.

Table 2
Area of Waters of the United States, Including Wetlands within the Project Area by Drainage

Drainage	Waters of the United States (excluding Wetlands) (acres)	Corps Wetlands (acres)	Total Waters of the United States (including Wetlands) (acres)
Santa Clara River	212.5[1]	258.8	471.2
Salt Creek	79.7	8.7	88.5
Potrero Canyon	31.4	7.3	38.7
San Martinez Grande Canyon	2.6	0.0	2.6
Chiquito Canyon	12.2	0.0	12.2
Long Canyon	5.7	0.0	5.7
Lion Canyon	6.9	0.0	6.9
Other Drainages Within RMDP site	32.3	2.1	34.4
Subtotal RMDP Site	**383.2**	**276.9**	**660.1**

[1] Data presented herein reflects geographic information system source data with very high data resolution. To facilitate the reader, values are rounded to the nearest 1/10 of an acre. Values reported as 0.0 may represent up to 0.0444 acre.
Source: URS (RMDP Waters/Streams 2004, RMDP Wetlands 2009; VCC Streams 2008, River Wetlands 2010); Glenn Lukos Associates (as revised September 15, 2008) (see **Appendix F4.6** of the Final EIS/EIR).

The extent of wetlands within the RMDP site was determined through a combination of fieldwork and analysis of high-resolution (6-inch pixels) aerial photography. On portions of the RMDP site not associated with the Santa Clara River main stem, field delineation techniques consistent with the Corps' Wetland Delineation Manual (Corps 1987) were used. Within the river main stem, where the extent of vegetated areas varies from year to year due to storm flows shaping the channel, Corps' 1987 field methods were employed only in the vicinity of proposed bridge crossings. In the remaining portions of the river main stem, delineation was performed based on aerial photography. A conservative approach was taken where aerial photography was used, and all vegetated areas within and adjacent to the active river channel were mapped as wetlands. This conservative approach, combined with the high resolution of the air photos used, ensured that small wetlands did not go undetected and that the extent of wetlands present was not underestimated. Wetlands were identified within the Santa Clara River corridor and in the Potrero Canyon and Salt Creek tributaries, as well as in a spring near the mouth of Middle Canyon (identified in the Hybrid Assessment of Riparian Condition (HARC) as reach MI-6). In total, 276.9 acres of wetlands were mapped within the RMDP site. The vast majority of this total consisted of vegetated areas within the river floodplain. Although these areas met the Corps' criteria for jurisdictional wetlands, it is important to note that the river is a highly dynamic system, and the location and extent of vegetated areas that may constitute wetlands varies from year to year as seasonal flood events scour and shape the channel. The wetlands observed in Salt Creek, Potrero Canyon, and at the Middle

Canyon spring complex are in areas with greater morphological stability and likely experience much more subtle changes in boundaries from year to year.

1.5.1 Hybrid Assessment of Riparian Condition

The HARC method is a quantitative tool used to evaluate and characterize the functional quality of wetlands, non-wetland waters of the United States, and riparian vegetation communities within the project site. The methodology was developed by URS Corporation (2007), in cooperation with the Corps, for the Santa Clara River basin. The HARC methodology adapts and combines elements from three widely used functional assessment methodologies: the California Rapid Assessment Methodology (Collins *et al.* 2008), the Hydrogeomorphic Classification (Smith *et al.* 1995), and the Landscape Level Functional Assessment (Smith 2000). The metric scores reflect the overall habitat, hydrologic, and biogeochemical functions of the riverine systems within the project area. The HARC method was developed specifically for the assessment of large sites within the Santa Clara River. The assessment methodology is explained in detail in **Section 4.2** of the Final EIS/EIR (Corps and CDFG 2010). Existing HARC scores for waters of the United States within the RMDP area are shown on Figure 5, Existing HARC Scores, and average-weighted (AW) HARC scores are summarized in Table 3. Pre-construction AW HARC scores will form the basis for determination of no net loss of functions and values through the evaluation process defined in **Section 7.0.**

Table 3
HARC Summary

Drainage	Corps' Jurisdiction Total Acreage	HARC AW-Total	Avg. HARC Score
Santa Clara River Main Stem			
Santa Clara River	471.2	*364.8*	0.77
Tributaries			
Lion Canyon	6.9	*5.4*	0.79
Long Canyon	5.7	*3.6*	0.62
Chiquito Canyon	12.2	*8.2*	0.67
Potrero Canyon	38.7	*31.6*	0.82
Salt Creek Canyon	88.5	*71.9*	0.81
San Martinez Grande Canyon	2.6	*2.1*	0.82
Agricultural Ditch	1.6	*0.2*	0.10
Ayers Canyon	2.6	*2.2*	0.85
Dead-End Canyon	1.3	*0.8*	0.60
Exxon Canyon	1.2	*1.0*	0.82
Homestead Canyon	0.2	*0.1*	0.59

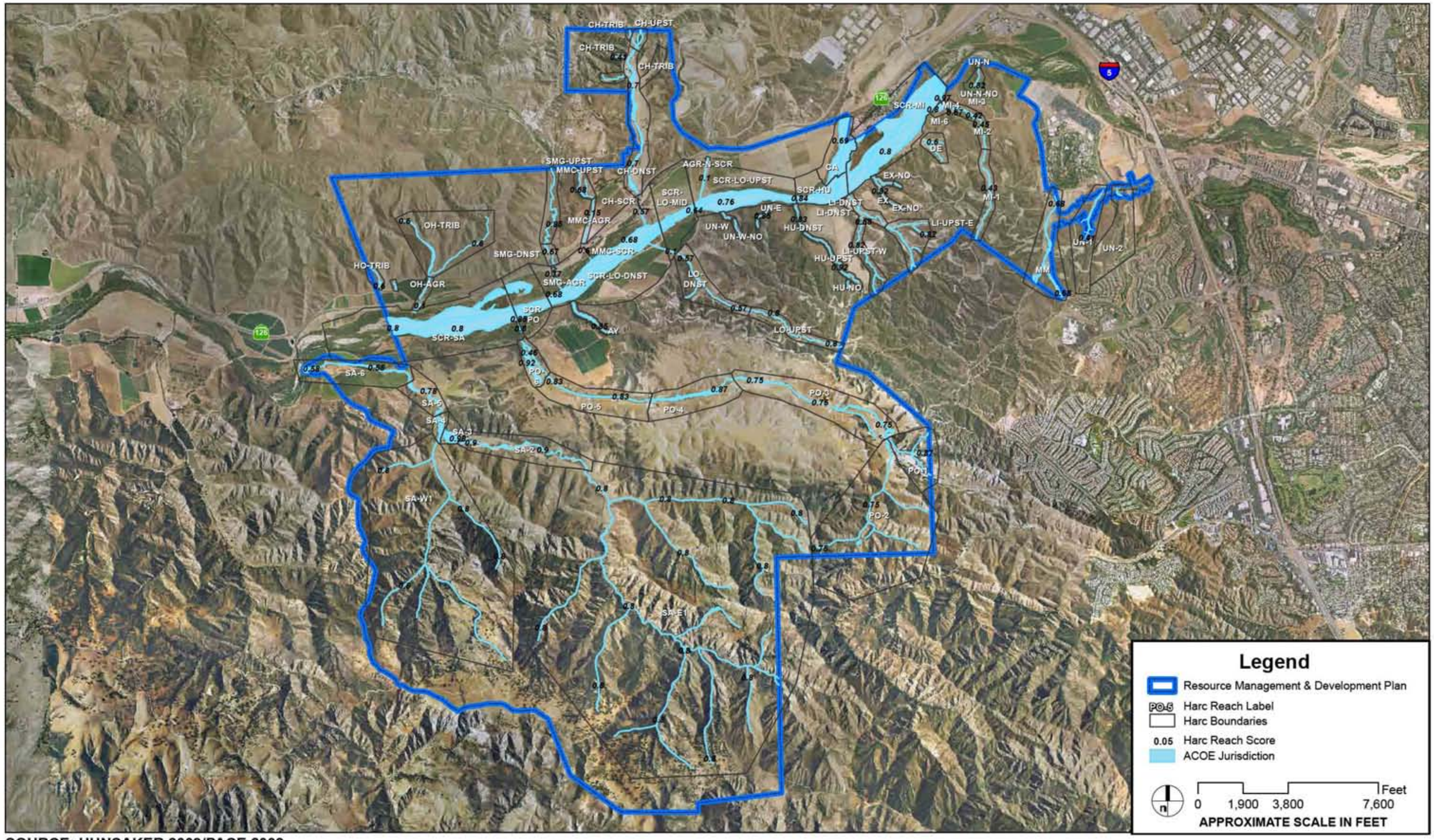
Table 3 (Continued)

Drainage	Corps' Jurisdiction Total Acreage	HARC AW-Total	Avg. HARC Score
Humble Canyon	1.9	*1.7*	0.90
Magic Mountain Canyon	6.4	*4.4*	0.68
Middle Canyon	5.7	*3.2*	0.56
Middle Canyon Spring Complex	2.1	*2.1*	1.00
Mid-Martinez Canyon	2.0	*0.9*	0.47
Off Haul Canyon	5.8	*2.7*	0.47
Unnamed Canyon 1	0.3	*0.1*	0.42
Unnamed Canyon 2	0.3	*0.1*	0.39
Unnamed Canyon A	0.8	*0.5*	0.60
Unnamed Canyon B	0.7	*0.6*	0.85
Unnamed Canyon C	0.7	*0.6*	0.85
Unnamed Canyon D	0.8	*0.7*	0.82
Tributary Totals	188.9	*144.6*	**0.77**
RMDP Project Area Total	660.1	*509.4*	**0.77**

Source: Final EIS/EIR (May 2010) **Appendix 4.6**.

1.5.2 Impacts to Waters of the United States

Implementation of the Draft LEDPA would result in permanent and temporary impacts to waters of the United States, as stated in Final EIS/EIR, **Section 4.6**, Jurisdictional Waters and Streams. Table 4 provides a summary of total acres of temporary and permanent impact of Corps-jurisdictional area for all phases of the RMDP development project. There are a total of 660.1 acres of Corps-jurisdictional area within the RMDP footprint (Figure 6, Waters of the United States within the RMDP Site; Figure 7, Proposed Land Uses and Jurisdictional Impacts.). The Draft LEDPA would result in permanent impacts to 7.7 acres of wetland waters of the United States and 58.6 acres of non-wetland waters of the United States (total 66.3 acres). The Draft LEDPA would result in temporary impacts to 11.4 acres of wetland waters of the United States and 20.8 acres of non-wetland waters of the United States (total 32.2 acres). Table 4 lists Corps' impacts by jurisdictional feature. Figure 8 depicts locations of modified, converted and preserved tributary drainages.



SOURCE: HUNSAKER 2009/PACE 2009

FIGURE 5

Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch RMDP

Existing HARC Scores

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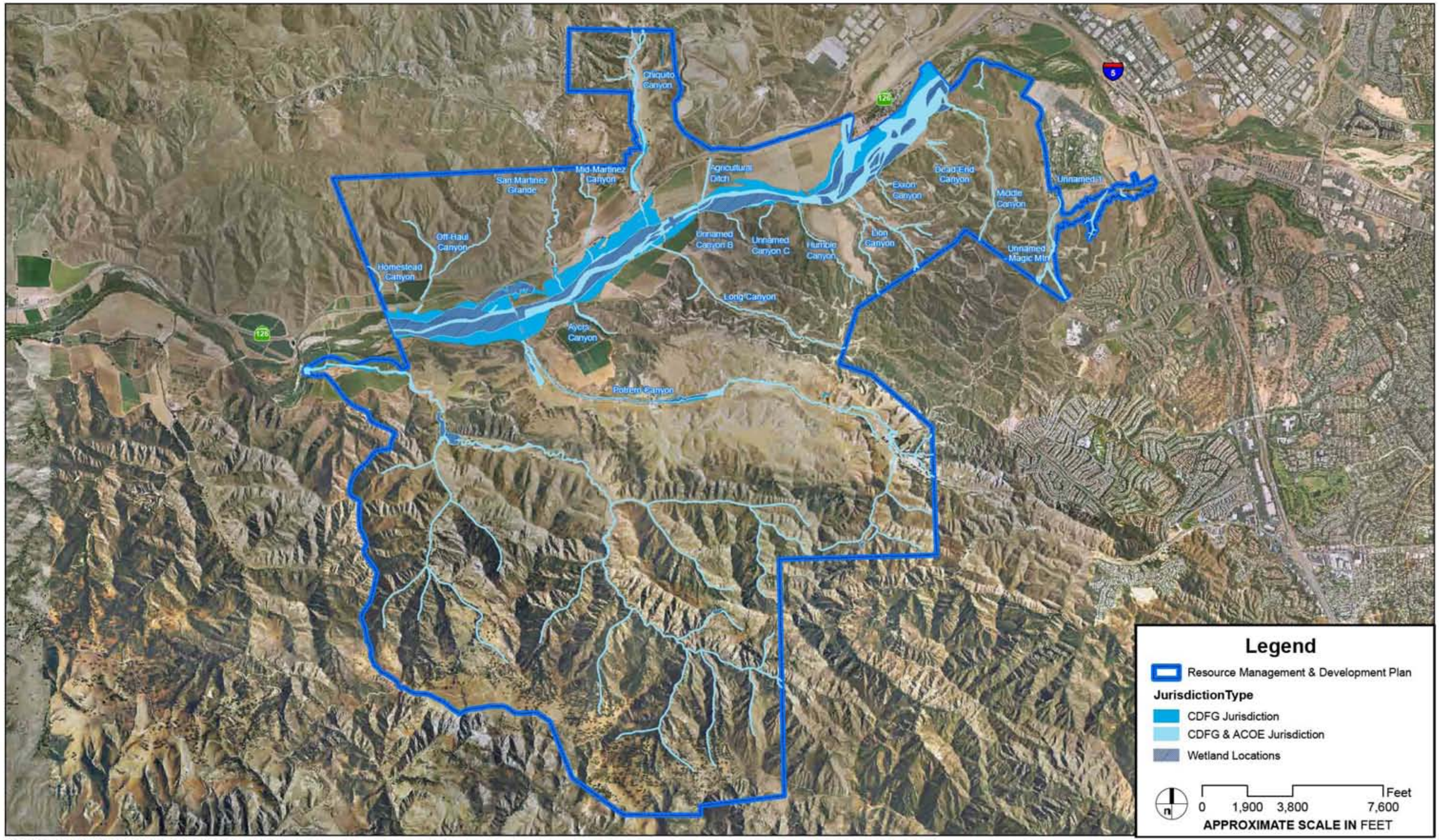


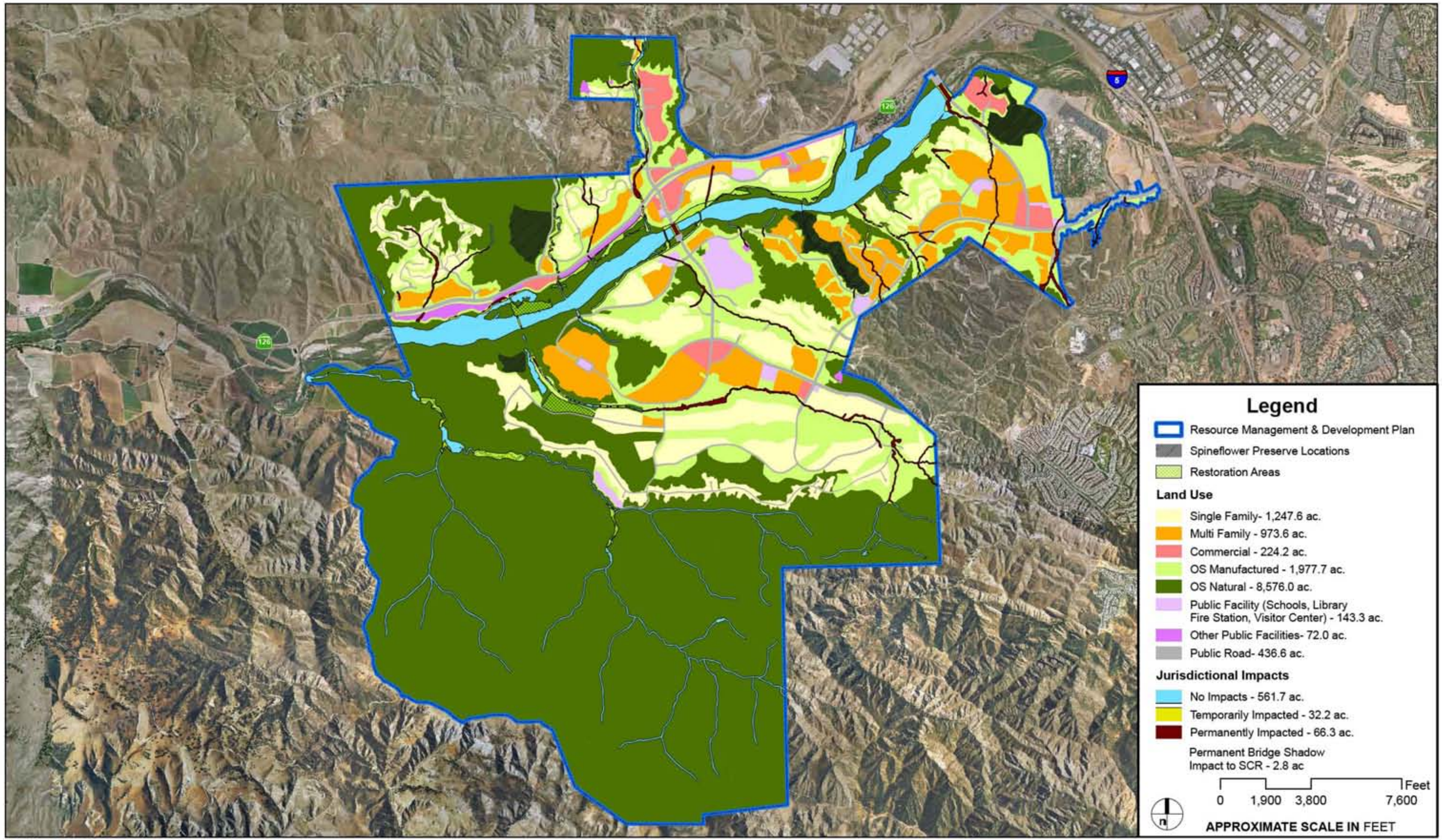
SOURCE: HUNSAKER 2009/PACE 2009

FIGURE 6

Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch RMDP

Waters of the United States within the RMDP Site

P:\8238E\GIS\mxds\LEDPA\ReportFigures_20100223\8238E_FIGURE-6_WatersofUSWithinRMDPPC1_20100223.mxd



SOURCE: HUNSAKER 2009/PACE 2009

FIGURE 7

Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch RMDP

Proposed Land Uses and Jurisdictional Impacts

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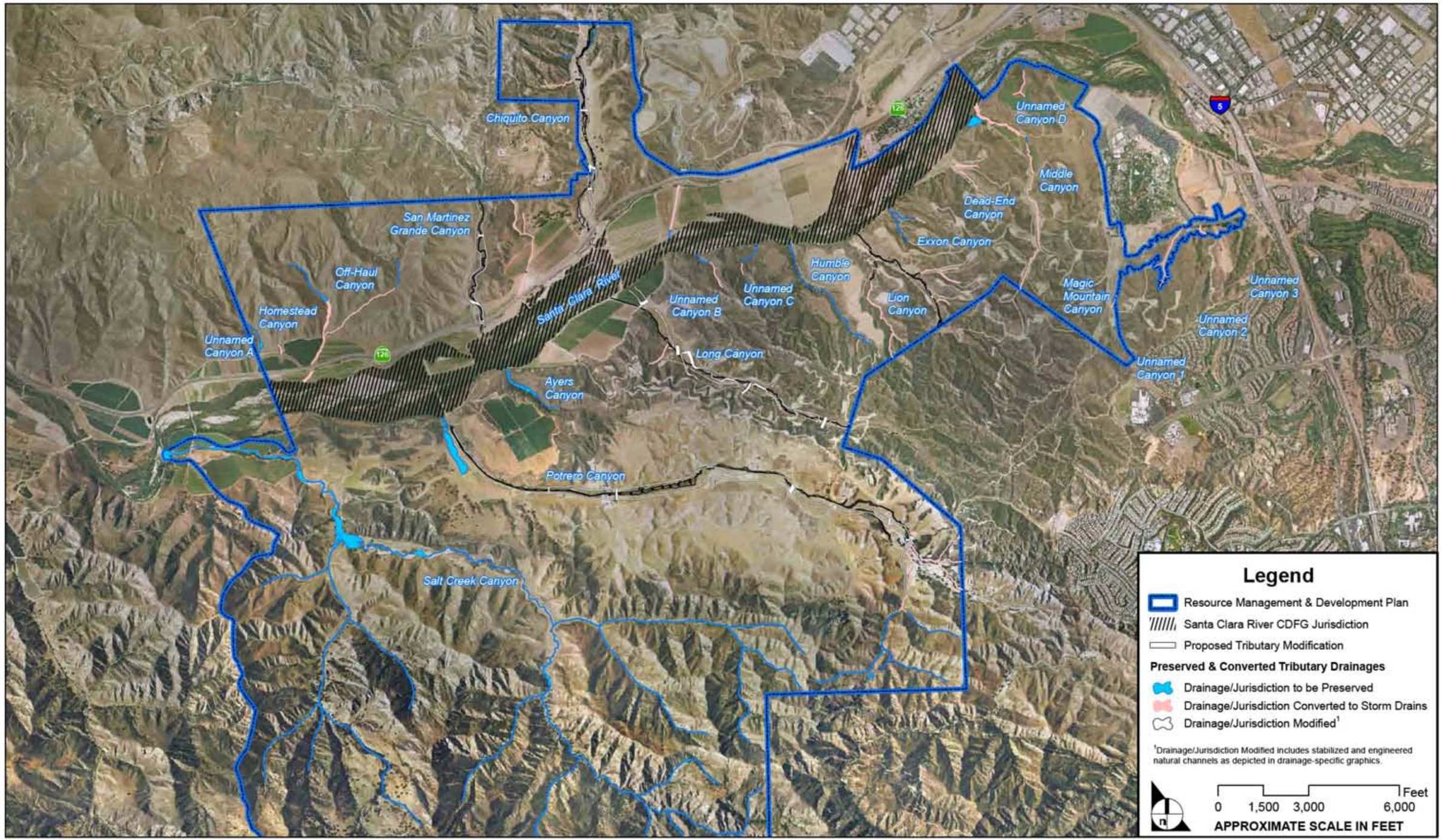

SOURCE: PACE - April 2010

FIGURE 8

Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch RMDP

Draft LEDPA Modified Converted, and Preserved Tributary Drainages

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Table 4
Summary of Corps Impacts by Jurisdictional Feature

Jurisdiction Name	Type of Impact	Waters of the U.S. (excluding Wetlands) (acres)	Wetlands (acres)	Total Waters of the U.S. (including wetlands) (acres)	Total Jurisdictional Area (acres)
Agriculture Ditch	Waters Avoided	0.2	0.0	0.2	
	Temporary Impact	0.1	0.0	0.1	1.6
	Permanent Impact	1.4	0.0	1.4	
Ayres Canyon	Waters Avoided	2.4	0.0	2.4	
	Temporary Impact	0.0	0.0	0.0	2.6
	Permanent Impact	0.2	0.0	0.2	
Chiquito Canyon	Waters Avoided	4.3	0.0	4.3	
	Temporary Impact	3.6	0.0	3.6	12.2
	Permanent Impact	4.4	0.0	4.4	
Dead-End Canyon	Waters Avoided	0.0	0.0	0.0	
	Temporary Impact	0.0	0.0	0.0	1.3
	Permanent Impact	1.3	0.0	1.3	
Exxon Canyon	Waters Avoided	0.9	0.0	0.9	
	Temporary Impact	0.0	0.0	0.0	1.2
	Permanent Impact	0.3	0.0	0.3	
Homestead Canyon	Waters Avoided	0.0	0.0	0.0	
	Temporary Impact	0.0	0.0	0.0	0.2
	Permanent Impact	0.2	0.0	0.2	
Humble Canyon	Waters Avoided	1.8	0.0	1.8	
	Temporary Impact	0.0	0.0	0.0	1.9
	Permanent Impact	0.1	0.0	0.1	
Lion Canyon	Waters Avoided	0.0	0.0	0.0	
	Temporary Impact	2.2	0.0	2.2	6.9
	Permanent Impact	4.7	0.0	4.7	
Long Canyon	Waters Avoided	0.0	0.0	0.0	
	Temporary Impact	0.0	0.0	0.0	5.7
	Permanent Impact	5.7	0.0	5.7	
Magic Mountain Canyon	Waters Avoided	0.0	0.0	0.0	
	Temporary Impact	0.0	0.0	0.0	6.4
	Permanent Impact	6.4	0.0	6.4	
Middle Canyon	Waters Avoided	0.1	2.1	2.2	
	Temporary Impact	0.0	0.0	0.0	7.8
	Permanent Impact	5.6	0.0	5.6	
Mid-Martinez Canyon	Waters Avoided	0.0	0.0	0.0	
	Temporary Impact	0.0	0.0	0.0	2.0
	Permanent Impact	2.0	0.0	2.0	
Off-Haul Canyon	Waters Avoided	0.3	0.0	0.3	
	Temporary Impact	0.0	0.0	0.0	5.8
	Permanent Impact	5.5	0.0	5.5	
Potrero Canyon	Waters Avoided	12.0	2.1	14.1	
	Temporary Impact	1.6	1.2	2.9	38.7

Table 4 (Continued)

		Waters of the U.S. (excluding Wetlands)	Wetlands	Total Waters of the U.S. (including wetlands)	Total Jurisdictional Area
	Permanent Impact	17.8	3.9	21.8	
Salt Creek Canyon	Waters Avoided	73.4	7.6	81.0	
	Temporary Impact	6.1	1.1	7.3	88.5
	Permanent Impact	0.2	0.0	0.2	
San Martinez Canyon	Waters Avoided	0.7	0.0	0.7	
	Temporary Impact	1.6	0.0	1.6	2.6
	Permanent Impact	0.2	0.0	0.2	
Santa Clara River	Waters Avoided	206.1	246.0	452.1	
	Temporary Impact	5.6	9.0	14.6	471.2
	Permanent Impact	0.8	3.7	4.5	
Unnamed Drainage A (Homestead East)	Waters Avoided	0.8	0.0	0.8	
	Temporary Impact	0.0	0.0	0.0	0.8
	Permanent Impact	0.0	0.0	0.0	
Unnamed Drainage B (Homestead Village West)	Waters Avoided	0.3	0.0	0.3	
	Temporary Impact	0.0	0.0	0.0	0.7
	Permanent Impact	0.5	0.0	0.5	
Unnamed Drainage C (Homestead Village West)	Waters Avoided	0.5	0.0	0.5	
	Temporary Impact	0.0	0.0	0.0	0.7
	Permanent Impact	0.2	0.0	0.2	
Unnamed Drainage D (Mission Village)	Waters Avoided	0.1	0.0	0.1	
	Temporary Impact	0.0	0.0	0.0	0.8
	Permanent Impact	0.7	0.0	0.7	
Unnamed Drainage 1	Waters Avoided	0.0	0.0	0.0	
	Temporary Impact	0.0	0.0	0.0	0.3
	Permanent Impact	0.3	0.0	0.3	
Unnamed Drainage 2	Waters Avoided	0.0	0.0	0.0	
	Temporary Impact	0.0	0.0	0.0	0.3
	Permanent Impact	0.3	0.0	0.3	
Total Waters Avoided		**303.8**	**257.8**	**561.7**	**660.1**
Total Temporary Impact		**20.8**	**11.4**	**32.2**	
Total Permanent Impact		**58.6**	**7.7**	**66.3**	
Combined Totals		**383.2**	**276.9**	**660.1**	

1.5.3 Impacts to Vegetation Communities

Implementation of the Draft LEDPA would result in permanent and temporary impacts as stated in the Final EIS/EIR. The existing conditions and anticipated impacts to vegetation communities within waters of the United States are depicted in Figure 7, Proposed Land Uses and Jurisdictional Impacts. The Draft LEDPA would result in temporary and permanent impacts to Corps-jurisdictional areas that support southern cottonwood–willow riparian forest, herbaceous wetlands (freshwater marsh and bulrush-cattail wetland), arrow weed scrub, mulefat scrub, river

wash, alluvial scrub, big sagebrush scrub, cismontane alkali marsh, southern coast live oak riparian forest, southern willow scrub, tamarisk scrub, and Mexican elderberry scrub.

1.6 Type(s), Functions, and Values of the Jurisdictional Areas to be Directly and Indirectly Impacted

Existing functions and values of jurisdictional features throughout the project area were quantitatively evaluated using the HARC methodology. The HARC assessment methodology was described briefly in **Subsection 1.4.1**, and HARC scores for jurisdictional features within the project area are represented on Figure 5.

Existing functions and values of the planned locations for the compensatory mitigation sites vary considerably depending on location. In general, the existing functions and values of the planned mitigation sites associated with the Santa Clara River (*e.g.*, Mayo Crossing and Landmark Village creation areas) are very limited due to the existing intensive agricultural land use that occurs there. Due to the repeated and frequent land disturbance practices associated with intensive agricultural, the areas lack functions and values that would benefit the Santa Clara River riparian system, such as native buffers, floodplain connectivity, and surface water persistence and recharge.

The tributary canyons currently provide some of the functions and values typical of intermittent and ephemeral drainages, such as riparian corridor connectivity, a natural water source, a natural flood-prone area, and biogeochemical processing. However, many of the canyon drainage channels are excessively incised due to instable substrate, limiting floodplain connectivity. Many of the tributary drainages also have poor buffer conditions in the lower reaches due to intensive agricultural use along the Santa Clara River corridor.

1.6.1 Vegetation Communities

Vegetation communities impacted by project construction range from disturbed vegetation communities dominated by weedy herbaceous vegetation containing vegetation with low existing functions and values to vegetation communities exhibiting high existing functions and values that include mature native vegetation with developed vertical structure and diversity of plant species. Many of the vegetated jurisdictional communities that would be impacted by the Project have been subject to some disturbance from grazing activities, agricultural activities, and oil extraction activities; however, these jurisdictional vegetated communities generally support the functions and values typical of natural vegetated wetland and riparian communities, such as dissipation of energy, cycling of nutrients, uptake of elements and compounds, retention of

particulates, export of organic carbon, and maintenance of plant and animal communities (*e.g.*, nesting, feeding, and breeding opportunities for various aquatic, terrestrial, and avian animals).

An overview of the vegetation communities within Corps' jurisdiction that would be impacted by the Draft LEDPA is provided below.

Southern Cottonwood–Willow Riparian Forest

The southern cottonwood–willow riparian forest within Corps' jurisdiction that would be impacted has a well-developed canopy layer composed of cottonwood trees. The community contains willow saplings and developed understory. The understory is dominated by exotic annual grasses, but native vegetation occurs, including mugwort (*Artemisia douglasiana*), California buckwheat (*Eriogonum fasciculatum* var. *foliolosum*), golden currant (*Ribes aureum*), and wild cucumber (*Marah macrocarpus*). In all strata, understory through canopy, native vegetation covers almost 70% of the vegetation community.

The southern cottonwood–willow riparian forest vegetation community is found primarily in patches along the margins of the Santa Clara River in locations where there is adequate surface and subsurface water year-round. There are a few patches of this vegetation community in some of the lower (downstream) reaches of the tributary canyons (*e.g.*, Middle Canyon). The functions of the southern cottonwood–willow riparian forest include enhanced water-holding capacity, filtration ability, and soil stability. The southern cottonwood–willow riparian forest provides breeding, feeding, and nesting habitat for avian, aquatic, and terrestrial animal species.

Mulefat Scrub

The mulefat scrub vegetation community within Corps' jurisdiction that would be impacted contains patchy riparian vegetation consisting mainly of mulefat. The understory is poorly developed and often bare. The understory vegetation is mostly composed of exotic species. There are sometimes a few riparian trees growing above the shrub layer. Other native species occur, but the variety and quantity are typically poor.

The mulefat vegetation community commonly occurs throughout the Project area along stream margins and floodplains. Mulefat scrub provides some breeding, feeding, and nesting habitat for avian, aquatic, and terrestrial animal species.

Arrow Weed Scrub

The arrow weed scrub community within Corps' jurisdiction is dominated by shrubs and understory species. There is no vegetation reaching into the canopy layer. Predominant non-native species include mustard and annual grasses, contributing to approximately 25% of the vegetated cover within the community. The arrow weed scrub is dominated by a small number of species, mainly arrow weed (*Pluchea sericea*), California sagebrush (*Artemisia californica*), and mustard. Arrow weed scrub provides some breeding, feeding, and nesting habitat for avian, aquatic, and terrestrial animal species.

River Wash

The river wash community within Corps' jurisdiction is predominantly flat and homogeneous. There are some microtopographic features, including meanders, bars, terraces, pits, ponds, and hummocks. On average, this community supports less than 5% vegetative cover. The vegetation surrounding the river wash is often diverse, containing both native and exotic plant vegetation. The river wash community provides area for river movement and meander; space for flood waters; and some habitat for avian, aquatic, and terrestrial animal species.

Cismontane Alkali Marsh

The cismontane alkali marsh within Corps' jurisdiction that would be impacted is predominantly flat and homogeneous. Cismontane alkali marsh is an herbaceous community dominated by salt grass (*Distichlis spicata*); the higher elevations and edges support native plants (*e.g.*, yerba mansa (*Anemopsis californica*), western ragweed (*Ambrosia psilostachya*), and spearscale (*Atriplex triangularis*)) and non-native plants (*e.g.*, sourclover (*Melilotus indica*), five-hooked bassia (*Bassia hyssopifolia*), and peppergrass (*Lepidium latifolium*)). Where water is actually flowing in small rills at the surface, winged three-square (*Scirpus americanus*) and Mexican rush (*Juncus mexicanus*) also occur. Cismontane alkali marsh provides foraging habitat for avian, aquatic, and terrestrial animal species.

Herbaceous Wetlands

The herbaceous wetlands that would be impacted include freshwater marsh and bulrush-cattail wetlands. The herbaceous wetlands on site occupy depressional areas where sufficient groundwater exists. These areas are in association with stream channels and ditches. Vegetation consists of occasional native shrubs, including mulefat, narrow-leaved willow (*Salix exigua*) arrow weed; native herbaceous species, such as broad-leaved cattail (*Typha latifolia)*, sedges (*Carex* spp.), cocklebur (*Xanthium strumarium*), California cottonweed (*Epilobium ciliatum*),

and bulrush (*Scirpus* ssp.); and non-native plants, including whorled dock (*Rumex conglomerates*), curly dock (*Rumex crispus*), and pepperweed. Herbaceous wetlands provide habitat for aquatic invertebrates (when sufficient surface water is present), insects, as well as foraging and feeding habitat for terrestrial and avian species.

Alluvial Scrub

The alluvial scrub within Corps' jurisdiction that would be impacted occurs along stream channels on terraced benches of varying elevations above the channel bottom, which receive less frequent inundation. Vegetation is dominated by California buckwheat, yerba santa, scale broom (*Lepidospartum squamatum*), and cudweed aster (*Lessingia* sp.). This vegetation community is adapted to flash floods, erosion, and dry summer periods. Its footprint has been greatly reduced over time in southern California due to sand mining and urbanization. Alluvial scrub provides foraging habitat for avian and terrestrial animal species and flood retention.

Big Sagebrush Scrub

The big sagebrush scrub within Corps' jurisdiction that would be impacted includes native shrubs (*e.g.*, Great Basin sagebrush, yerba santa, and California sagebrush); herbaceous species, including native plants (*e.g.*, California aster (*Lessingia filaginifolia*), wild cucumber, shrubby phacelia (*Phacelia ramosissima*), and common owl's clover (*Castilleja exserta*)); and non-native herbs (*e.g.*, red-stemmed filaree (*Erodium cicutarium*), tree tobacco (*Nicotiana glauca*), milk thistle (*Silybum marianum*), and horehound (*Marrubium vulgare*)). This vegetation community can occur in a variety of site conditions ranging from rocky, well-drained soils to fine, sandy soils with a higher water table. It can tolerate a variety of temperature ranges and elevations. Big sagebrush scrub provides breeding, feeding, and foraging habitat for terrestrial and avian wildlife species.

Southern Willow Scrub

The southern willow scrub within Corps' jurisdiction that would be impacted includes red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), and Goodding's black willow (*Salix gooddingii*) trees; native shrubs, including mulefat, narrow-leaved willow, and arrow weed; native herbaceous species, including western ragweed, arroyo lupine (*Lupinus succulentus*), yellow fiddleneck (*Amsinckia menziesii* var. *intermedia; Amsinckia menziesii* var. *intermedia*) , and caterpillar phacelia (*Phacelia cicutaria* var. *hispida*); and non-native plants (white sweet-clover (*Melilotus alba*), tumble mustard (*Sisymbrium altissimum*), hedge mustard (*Sisymbrium officinale*), and milk thistle). Southern willow scrub occurs in depositional areas of

floodplains and along stream channels with a shallow water table, where repeated flooding occurs. Willow species form thick canopies, with an increasingly sparse understory as canopy densities increase. Southern willow scrub provides breeding, feeding, nesting, and foraging habitat to aquatic (when surface water is present), amphibian, insect, avian, and terrestrial wildlife species. Song birds utilize the willow canopy for roosting and nesting habitat.

Southern Coast Live Oak Riparian Forest

The southern coast live oak riparian forest that would be impacted within Corps' jurisdiction impacted is dominated by coast live oak (*Quercus agrifolia*) with sparse understory of forbes and non-native grasses. It occurs in bottomlands, canyons, and outer floodplains along larger streams, on fine-grained, rich alluvium. Southern coast live oak riparian forest provides nesting, feeding, breeding, and foraging habitat for avian and terrestrial wildlife species.

Mexican Elderberry Scrub

The Mexican elderberry scrub within Corps' jurisdiction that would be impacted is dominated by Mexican elderberry (*Sambucus mexicana*), California sagebrush, bush monkeyflower (*Mimulus aurantiacus*), shrubby phacelia, golden currant, caterpillar phacelia, and wild cucumber. It occurs on north-facing slopes, sometimes along drainage channels. Mexican elderberry scrub provides nesting, feeding, breeding, and foraging habitat for avian and terrestrial wildlife species.

1.6.2 Hydrologic Regime

The vegetated and unvegetated stream channels that are associated with tributary drainages typically convey stormwater flow only during precipitation events and for a short period after (usually less than 24 hours). They are generally composed of a coarse sandy, alluvial bottom, often with steep side banks. These tributary stream channels provide storm flow conveyance, surface water storage, subsurface water storage, and moderation of groundwater flow or discharge. However, because the channels are mostly unvegetated, they provide very minimal biotic functions and values for plants and wildlife.

In some instances, tributary channels are incised, hydrolocally isolating the drainage channel from the historic valley floodplain. Channel incisement can be generally attributed to past land uses such as oil extraction access road crossings, agriculture, and grazing that alter flow gradients to erosive velocities, causing bed instability and degradation. These conditions reduce hydraulic functions such as groundwater recharge, soil moisture replenishment, and vegetation support. Vegetation recruitment is limited by high-velocity flow that scours streambeds, removing fine bedload materials that have higher moisture-retaining properties. Coarse-grained

bed material has high porosity and percolation causing soil surfaces to quickly dry, thereby limiting seed germination opportunities.

Within the Santa Clara River, hydraulic effects of high-velocity flow are more localized within the broader floodway. This allows migration of season flow channels within the larger floodway, resulting in a greater diversity of bed grain size distribution. Fluvial features such as sandbars, cut banks, and multiple-year secondary channels result in a variety of soil and moisture conditions that express equally diverse vegetation communities.

1.6.3 Topographic Complexity

Topographic diversity in tributary drainages can be very subtle and diverse, as observed in Potrero Canyon wetlands, or limited where incised channels or pastureland grazing are present. Along the Santa Clara River, high topographic diversity that is created by the hydrologic regime, as described above, affects moisture regimes, and frequency of flood scour that give rise to different vegetation community types.

1.6.4 Biochemical Processes

In areas where incised channels are present, biochemical processes in the tributary drainages are limited by a general lack of vegetation cover, woody debris, leaf litter, or detritus. The cause of this condition is described above and generally relates to the combined effects of hydrology, bed material, and lack of topographic complexity. In channel sections without scour, biochemical functions still remain low due to land uses that have reduced adjacent uplands and wetlands vegetation either through direct removal (pastureland/grazing) or through hydraulic modifications. This limits the availability of woody materials that persist in channel areas. Conversely, grasses degrade rapidly and degrade water quality, unlike woody materials that decompose slowly and promote beneficial biochemical functions.

Biochemical function in the Santa Clara River is relatively high compared to tributary drainages. Vegetation diversity, hydrologic regime, and topographic complexity combine to trap and retain woody debris, leaf litter, and debris within the floodway. These materials promote beneficial biochemical processes and provide diverse resources for invertebrate populations.

2.0 GOALS OF THE COMPENSATORY MITIGATION PROJECT

The goal of this Plan is to provide a framework mitigation document that guides mitigation planning and implementation through all development phases. The primary goal of the mitigation project is to ensure that there is no net loss of acreage or functions/values from

implementation of the RMDP. The permanent removal of existing habitats in Corps-jurisdictional areas in the Santa Clara River and tributaries shall be replaced by creating and restoring Corps-jurisdictional habitats of similar functions and values. Temporary impacts to Corps-jurisdictional areas shall be mitigated by restoring the affected areas to the habitat type present prior to impacts. As individual Project components are proposed for construction, consistent with the construction notification process, quantities of mitigation acreage required for impacts to Corps-jurisdictional areas shall be calculated in accordance with the requirements outlined in this Plan. Overall, under the Draft LEDPA, Newhall will create up to 63.3 acres of compensatory mitigation, of which up to 7.7 acres are wetlands. In addition, Newhall will restore 32.2 acres of temporarily impacted waters of the United States.

The design intent will be to create/replace vegetation communities in Corps-jurisdictional areas that are consistent with adjacent existing riparian vegetation communities and compatible with the fluvial morphology and hydrology of the stream channel corridor. The design will also focus on restoring the floodplain functions and services/values lost during project construction. The restoration approach will be to create vegetation communities that are self-sustaining and functional beyond the maintenance and monitoring period.

2.1 Mitigation Requirements

Consistent with Corps' Guidance, including Regulatory Guidance Letter No. 02-2 (Dec. 24, 2002) and the Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines (Feb. 6, 1990), the mitigation requirements in this Plan are designed to compensate for the loss of jurisdictional areas in the RMDP study area so as to ensure no net loss either of acreage or of functions and services. The primary mechanisms for mitigating the loss of jurisdictional areas are creation, restoration and enhancement. For purposes of this Plan, "creation" is defined as conversion of existing upland areas to Corps' jurisdiction (either ordinary high water mark or wetlands). "Restoration" is defined as the managed replacement of degraded stream and wetland habitats (either from natural geomorphic process or more anthropogenic effects) to their prior undisturbed and/or stable condition, usually through recontouring of banks, control of streambed geomorphological processes, and establishment of appropriate native habitats. "Enhancement" is defined as the removal of invasive plant species from existing jurisdictional areas and/or the establishment of native habitats where non-native species have colonized. Mitigation Measure BIO-2 of the Final EIS/EIR describes the mitigation requirements for impacts to Corps- and CDFG-jurisdictional resources:

BIO-2 The permanent removal of existing habitats in Corps and/or CDFG jurisdictional areas in the Santa Clara River and tributaries, shall be replaced by creating habitats of similar functions and values/services (see Mitigation Measure BIO-4 and Mitigation Measure SW-3 of Section 4.6 of the Final EIS/EIR) on the Project site, or as allowed under Mitigation Measure BIO-10.

a. Permanent impacts to Corps jurisdiction (which is a subset of CDFG jurisdiction) are to be mitigated by initiating mitigation site creation and/or restoration in advance of impacts, to replace the combined loss of acreage, functions and services at a minimum 1:1 ratio. Initiation of a Corps mitigation site is defined as: 1) completion of site preparation; 2) installation of temporary irrigation; and 3) seeding and/or planting of the mitigation site. For detailed information please refer to the Mitigation Plan for Impacts to Waters of the United States included in the Draft 404(b)(1) Alternatives Analysis in Appendix F1.0 of the Final EIS/EIR. The Salt Creek creation and restoration site and the Mayo Crossing restoration site (i.e., an existing agricultural field) are considered the initial sites to be implemented prior to Corps jurisdictional impacts by development, thereby establishing upfront mitigation credits. As individual Project components are proposed for construction, consistent with the construction notification, quantities of mitigation acreage required to offset permanent impact acreages shall be calculated and compared to surplus pre-mitigation area remaining. A project would not proceed unless adequate mitigation capacity (area suitable for Corps mitigation) is demonstrated. Temporary impact areas shall be mitigated in place in a manner that restores impacted functions and services as described in the mitigation plan noted above. If upfront compensatory mitigation cannot be achieved, a Corps-approved method would be utilized to determine the additional compensatory mitigation to offset the temporal loss of functions and services not included in the 1:1 mitigation ratio for permanent impacts.

These measures satisfy the Corps mitigation requirements for impacts to Corps jurisdictional areas. However, impacts to jurisdictional areas (which include all areas subject to Corps and/or CDFG jurisdiction) are also subject to all of the mitigation requirements for impacts to CDFG jurisdiction, including BIO-2b.

b. For permanent and temporary impacts to CDFG jurisdiction, consistent with the sub-notification, quantities of mitigation acreage required shall be calculated in accordance with the criteria below:

- If suitable mitigation sites have met success criteria (BIO-6) prior to disturbance at the impact site, the mitigation sites shall replace the permanently impacted habitats in kind at a 1:1 ratio.
- If a suitable mitigation site has not met success criteria prior to disturbance of the impact site, habitat shall be replaced in kind (tributary for tributary impacts, river for river impacts) according to the replacement ratios specified in **Table 4.5-68**, below.

These ratios provide compensatory mitigation for temporal losses of riparian function by considering the existing functional condition of the resources to be impacted, as well as time required for different vegetation types to become established and mature.

- If a suitable mitigation site has not been initiated within two years following disturbance of the impact site, but is initiated within five years following such disturbance, the permanently impacted habitats shall be replaced in kind at a replacement ratio equal to the ratio required by **Table 4.5-68**, below, plus 0.5:1. (For example, if mitigation for impacts to high-quality mulefat scrub were initiated three years after disturbance, the required replacement ratio would be 2.5:1.)
- If a suitable mitigation site has not been initiated within five years following disturbance of the impact site, the permanently impacted habitats shall be replaced in kind at a replacement ratio equal to the ratio required by **Table 4.5-68**, below, plus 1:1. (For example, if mitigation for impacts to high-quality mulefat scrub were initiated six years after disturbance, the required replacement ratio would be 3:1.)

Where temporary impacts to CDFG-jurisdictional areas are proposed, the mitigation acreage required shall be determined based upon the duration of the proposed construction disturbance and the type of vegetation to be impacted. As individual Project components are proposed for construction, consistent with the sub-notification process, the quantities of mitigation acreage required for temporary impacts to CDFG jurisdictional areas shall be calculated according to the following criteria:

- If suitable mitigation sites have met success criteria prior to temporary disturbance at the impact site, the mitigation sites shall replace the temporarily impacted habitats in kind at a 1:1 ratio regardless of the duration of the temporary disturbance.
- If the duration of temporary disturbance is less than two years, and no suitable mitigation sites have met success criteria prior to the disturbance, temporarily impacted habitats shall be replaced in kind at a 1:1 ratio, except for southern cottonwood/willow riparian forest and oak woodland habitats, which shall be replaced in kind at a ratio of 1:1 if low quality, 1.5:1 if medium quality, and 2:1 if high quality.
- If the duration of temporary disturbance is between two and five years, and no suitable mitigation sites have met success criteria prior to the disturbance, temporarily impacted habitats shall be replaced in kind at a 1.5:1 ratio, except for southern cottonwood/willow riparian forest and oak woodland habitats, which shall be replaced in kind at a ratio of 1:1 if low quality, 1.5:1 if medium quality, and 2:1 if high quality.
- If the duration of temporary disturbance exceeds five years, and no suitable mitigation sites have met success criteria prior to the disturbance, temporarily impacted habitats shall be replaced in kind at a 2:1 ratio, except for southern

cottonwood/willow riparian forest and oak woodland habitats, which shall be replaced in kind at a ratio of 1:1 if low quality, 1.5:1 if medium quality, and 2:1 if high quality.

In lieu of the habitat replacement described above and subject to CDFG approval, removal of invasive, exotic plant species from existing CDFG jurisdictional areas, followed by restoration/revegetation, may also be used to offset impacts. If this method is employed, mitigation shall be credited at an acreage equivalent to the percentage of exotic vegetation present at the restoration site. For example, if a 10-acre jurisdictional area is occupied by 10% exotic species, restoration shall be credited for 1 acre of impact. If appropriate, as authorized by CDFG, reduced percentage credits may be applied for invasive removal with passive restoration (weeding and documentation of natural recruitment only).

(Revised) Table 4.5-68
CDFG Jurisdictional Permanent Impacts Mitigation Ratios

Ratios Listed by Vegetation Types & Quality				
Vegetation Community	Veg Code / ID	HIGH Reach Value*	MEDIUM Reach Value**	LOW Reach Value***
		(Mit. Ratio)	(Mit. Ratio)	(Mit. Ratio)
Southern Cottonwood–Willow Riparian Forrest	SCWRF	4:1	3:1	2:1
Southern Willow Scrub	SWS	3:1	2.5:1	2:1
Oak Woodland (Coast Live, Valley)	CLOW / VOW	3:1	2.5:1	2:1
Big Sagebrush Scrub	BSS	2.5:1	2:1	1.5:1
Mexican Elderberry Scrub	MES	2.5:1	2:1	1.5:1
Cismontane Alkaline Marsh	CAM	2.5:1	2:1	1.5:1
Coastal and Valley Fresh Water Marsh	CFWM	2:1	1.5:1	1:1
Mulefat Scrub	MFS	2:1	1.5:1	1.25:1
Arrowweed Scrub	AWS	2:1	1.5:1	1:1
California Sagebrush scrub, and CSB-dominated habitats	CSB, CSB-A, -BS, -CB, -CHP, and -PS	2:1	1.5:1	1:1
Herbaceous Wetland	HW	1.5:1	1.25:1	1:1
River Wash, emergent veg.	RW	1.5:1	1.25:1	1:1
Chaparral, Chamise Chaparral	CHP, CC	1.5:1	1.25:1	1:1
Coyote Brush Scrub	CYS	1.5:1	1.25:1	1:1

(Revised) Table 4.5-68
CDFG Jurisdictional Permanent Impacts Mitigation Ratios

Eriodictyon Scrub	EDS	1.5:1	1.25:1	1:1
California Grass Lands	CGL	1:1	1:1	1:1
Agricultural / Disturbed / Developed	AGR / DL / DEV	1:1	1:1	1:1

Notes:

* HIGH reach value indicates a portion of the Santa Clara River or main tributary that scored above 0.79 Total Score utilizing the HARC methodology described in revised **Section 4.2**, Geomorphology and Riparian Resources, of this EIS/EIR.

** MEDIUM reach value indicates a portion of the Santa Clara River or main tributary that scored between 0.4 and 0.79 Total Score utilizing the HARC methodology described in revised **Section 4.2.**

*** LOW reach value indicates a portion of the Santa Clara River or main tributary that scored below 0.4 Total Score utilizing the HARC methodology described in revised **Section 4.2.**

To achieve the goal of no net loss, the Plan requires project mitigation for impacts to achieve at least a 1:1 mitigation ratio, as measured by Corps-jurisdictional acreage and by HARC-average-weighted-score (HARC AW-score) units and as described above in BIO-2. The success criteria are set out in **Section 6.1**. Under **Section 6.1**, the acreage of waters of the United States after mitigation shall equal or exceed the acreage of waters of the United States prior to project impacts; and the total HARC AW-score units for waters of the United States after mitigation shall equal or exceed the pre-project total HARC AW-score units for waters of the United States. The HARC AW-score, which is explained in greater detail below, provides a quantitative assessment of the functions and services provided by a given impact area or mitigation area.

In order to minimize temporal loss of functions and services, this Plan provides a phasing strategy for mitigation and impacts within the entire project area (Figure 9a). Based on the phasing strategy, Newhall will mitigate for permanent impacts associated with development in advance by implementation of mitigation sufficient to achieve a minimum 1:1 ratio of acres and of functions and services upon completion as defined in **Section 6.1**.

No permanent development impacts would occur in a given phase until the necessary mitigation has been implemented, as defined above in BIO-2.

Under the phasing strategy, mitigation implemented prior to or concurrent with permanent development-related impacts to jurisdictional areas is referred to as "pre-mitigation." Mitigation implemented prior to the first phase of development would provide pre-mitigation for the initial development-related impacts. Mitigation implemented during each development phase would provide pre-mitigation for subsequent phases of development. Any excess mitigation acreage implemented in a given phase would be applied to subsequent phases of development. For

temporary impacts to waters of the United States, this Plan requires that the temporarily disturbed areas be restored in place at a 1:1 ratio following the completion of construction.

Overall, under the Draft LEDPA, Newhall would create at least 63.3 acres of compensatory mitigation, of which at least 7.7 acres would be wetlands. In addition, Newhall would restore 32.2 acres of temporarily impacted waters of the United States. Newhall will initiate establishment and restoration activities in Salt Creek and Santa Clara River (Mayo Crossing area). In this initial phase, approximately 20.4 acres of compensatory mitigation would be implemented in Salt Creek and 15.9 acres would be implemented in the Santa Clara River, for a total of 36.4 acres of mitigation area. Prior to or concurrent with construction activities in waters of the United States associated with the various phases of the proposed development, additional potential compensatory mitigation areas would be available, including approximately 21.1 acres in upper Long Canyon, 1.4 acres in lower Long Canyon, 1.3 acres in Lion Canyon, and 6.0 acres in San Martinez Grande Canyon. Furthermore, implementation of the Draft LEDPA would create up to 70.0 acres jurisdictional area in Potrero Canyon, 11.1 acres in Chiquito Canyon, and an additional 17.0 acres within the Santa Clara River, ensuring no net loss Corps-jurisdictional acreage or of physical and biological functions and services (resulting in a total of approximately 164.3 acres of potential compensatory mitigation creation in the project area,). In addition, an approximately 19-acre wetland mitigation area could be implemented in lower Potrero Canyon, contiguous with the preserved lower mesic meadow (cismontane alkali marsh) wetland preservation area. All compensatory mitigation areas would be subject to at least 5 years of mitigation monitoring and would be protected in perpetuity by a conservation easement or covenant.

The sequence of phasing shown in this Plan is the assumed project construction sequence over the build-out period. However, the phasing sequence, or components of phases, may change. Regardless, the concept of pre-mitigation and phasing would still be applied to achieve the goal of no temporal loss of functions and values for Corps-jurisdictional areas.

Overall, the mitigation described in this Plan will result in a net increase in acreage of waters of the United States within the RMDP area. In addition, the RMDP also includes extensive preservation of waters of the United States avoided within the RMDP area. These waters, and the habitat they support, will be protected in perpetuity by the same conservation mechanisms that apply to the mitigation areas described in **Section 9.2** of this Plan. Preservation and management under these conservation mechanisms will protect and enhance the functions and services provided by these jurisdictional areas.

2.1.1 Impacts and Mitigation Area Available

Implementation of the Draft LEDPA would result in the permanent conversion of 7.7 acres of wetland waters of the United States and 58.6 acres of non-wetland waters of the United States (a total of 66.3 acres). Similarly, temporary impacts would include 11.4 acres of wetland waters of the United States and 20.8 acres of non-wetland waters of the United States (a total of 32.2 acres). Table 5 summarizes the temporary and permanent impacts to Corps-jurisdictional area with implementation of the Draft LEDPA by phase.

In order to evaluate these impacts in the context of functions and services, functional units have been calculated for the affected areas by multiplying the acreage of the impact area by the HARC score for the affected stream channel reach. These functional units are termed HARC AW-score units. Table 6 provides a summary of the total HARC AW-score units for each development phase.

Table 5
Corps-Jurisdictional Impacts Assessed by Phase

Type of Impact	Impacts - River	Impacts - Tributaries	Impacts Total
	(acres)		
Salt Creek			
Permanent Impacts	0.0	0.2	0.2
Temporary Impacts	0.0	7.2	7.3
		Salt Creek Total	*7.5*
Phase 1: Landmark Village			
Permanent Impacts	1.2	2.3	3.5
Temporary Impacts	2.7	0	2.7
		Phase 1 Landmark Village Total	*6.2*
Phase 2: Mission Village			
Permanent Impacts	2.3	17.4	19.7
Temporary Impacts	5.4	0	5.4
		Phase 2 Mission Village Total	*25.1*
Phase 3: WRP Utility Corridor			
Permanent Impacts	1.0	0.8	1.8
Temporary Impacts	3.0	0.0	3.0
		Phase 3 WRP Utility Corridor Total	*4.8*
Phase 4: Homestead Village South			
Permanent Impacts	0.0	7.8	7.8
Temporary Impacts	0.0	2.2	2.2
		Phase 4 Homestead Village South Total	*10.0*

Table 5 (Continued)

Type of Impact	Impacts - River	Impacts - Tributaries	Impacts Total
	(acres)		
Phase 5: Homestead Village North			
Permanent Impacts	0.0	11.4	11.4
Temporary Impacts	0.0	5.2	5.2
Phase 5 Homestead Village North Total			*16.6*
Phase 6: Potrero Village			
Permanent Impacts	0.0	21.8	21.8
Temporary Impacts	3.4	2.9	6.4
Phase 6 Potrero Village Total			*28.1*
Permanent Impacts			66.3
Temporary Impacts			32.2
Combined Phases Total Impacts			97.2

Note: Totals may not add due to rounding.

Table 6
Impacts Assessed by Average HARC Scores and AW-Score Units by Phase

Type of Impact	HARC - River Impacts	HARC - Tributary Impacts	HARC Impacts Total	Calculated Average HARC Total Score
	(HARC AW-score Units)			
Salt Creek				
Permanent Impacts	0.0	0.2	0.2	0.80
Temporary Impacts	0.0	6.4	6.4	0.88
Salt Creek Total			*6.6*	*0.88*
Phase 1: Landmark Village				
Permanent Impacts	0.8	2.6	3.4	0.52
Temporary Impacts	1.7	0.4	2.1	0.64
Phase 1 Landmark Village Total			*5.5*	*0.56*
Phase 2: Mission Village				
Permanent Impacts	1.8	11.3	13.1	0.67
Temporary Impacts	4.3	0.9	5.2	0.79
Phase 2 Mission Village Total			*18.3*	*0.70*
Phase 3: WRP Utility Corridor				
Permanent Impacts	0.8	0.1	0.9	0.49
Temporary Impacts	2.5	0.0	2.5	0.82
Phase 3 WRP Utility Corridor Total			*3.4*	*0.69*
Phase 4: Homestead Village South				
Permanent Impacts	0.0	5.7	5.7	0.72
Temporary Impacts	0.0	0.8	0.8	0.80

Table 6 (Continued)

Type of Impact	HARC - River Impacts	HARC - Tributary Impacts	HARC Impacts Total	Calculated Average HARC Total Score
	(HARC AW-score Units)			
Phase 4 Homestead Village South Total			*6.4*	*0.73*
Phase 5: Homestead Village North				
Permanent Impacts	0.0	4.5	4.5	0.52
Temporary Impacts	0.0	3.4	3.4	0.73
Phase 5 Homestead Village North Total			*7.9*	*0.60*
Phase 6: Potrero Village				
Permanent Impacts	0.0	17.6	17.6	0.81
Temporary Impacts	2.8	2.1	4.9	0.77
Phase 6 Potrero Village Total			*22.5*	*0.80*
Total Permanent Impacts - HARC			45.3	0.68
Total Temporary Impacts - HARC			25.2	0.78
Combined Phases Total Impacts - HARC			70.5	0.72

Note: Totals may not add due to rounding.

2.1.1.1 Phase 1: Landmark Village Impacts and Mitigation

As shown in Table 5, implementation of the Landmark Village phase would result in 2.7 acres of temporary impacts (all within the Santa Clara River) and 3.5 acres of permanent impacts (2.3 acres tributary and 1.2 acre Santa Clara River) to jurisdictional resources. Temporary impacts would be restored in place after the completion of construction. Mitigation for permanent impacts will be provided by applying mitigation credit obtained from pre-mitigation at Salt Creek and Mayo Crossing at a 1:1 ratio for acreage (Figure 9b). The goal is that the functions and values provided by the pre-mitigation at Salt Creek and Mayo Crossing, and the restored temporary impact areas within Landmark Village, would meet or exceed the average HARC score functions and values for the impacted areas, providing a total of at least 5.5 HARC AW-score units as compensation for temporary and permanent impacts.

2.1.1.2 Phase 2: Mission Village Impacts and Mitigation

The implementation of the Mission Village phase would result in 5.4 acres of temporary impacts (all within the Santa Clara River) and 19.7 acres of permanent impacts (17.4 acres tributary and 2.3 acres Santa Clara River) to jurisdictional resources. Temporary impacts would be restored in place after the completion of construction. Mitigation for permanent impacts will be provided by applying mitigation credit obtained from pre-mitigation at Salt Creek and Mayo Crossing, as well as mitigation credit obtained from the implementation of project-associated mitigation at

lower Chiquito Canyon and lower Lion Canyon within the Landmark Village project area (Figure 9c). The goal is that the functions and values provided by the pre-mitigation at Salt Creek and Mayo Crossing, and the restored temporary impact areas within Mission Village, would meet or exceed the average HARC score functions and values for the impacted areas, providing a total of at least 18.3 HARC AW-score units as compensation for temporary and permanent impacts.

2.1.1.3 Phase 3: WRP Utility Corridor Impacts and Mitigation

The implementation of the WRP Utility Corridor phase would result in 3.0 acres of temporary impacts (all within the Santa Clara River) and 1.8 acre of permanent impacts (0.8 acre tributary and 1.0 acre Santa Clara River) to jurisdictional resources. Temporary impacts would be restored in place after the completion of construction. Mitigation for permanent impacts will be provided by applying mitigation credit obtained from pre-mitigation at Mayo Crossing, as well as mitigation credit obtained from the implementation of mitigation at lower Lion Canyon and along the margins of the Santa Clara River within the Landmark Village project area (Figure 9d). The goal is that the functions and values provided by the pre-mitigation at Salt Creek and Mayo Crossing, and the restored temporary impact areas within the WRP Utility Corridor, would meet or exceed the average HARC score functions and values for the impacted areas, providing a total of at least 3.4 HARC AW-score units as compensation for temporary and permanent impacts.

2.1.1.4 Phase 4: Homestead Village South Impacts and Mitigation

The implementation of the Homestead Village South phase would result in 2.2 acres of temporary impacts (all within tributary drainages) and 7.8 acres of permanent impacts (also all within tributary drainages) to jurisdictional resources. Temporary impacts would be restored in place after the completion of construction. Mitigation for permanent impacts will be provided by applying remaining pre-mitigation credit at Mayo Crossing (Figure 9e). The goal is that the functions and values provided by the mitigation at Mayo Crossing, and the restored temporary impact areas within the Homestead Village South project, would meet or exceed the average HARC score functions and values for the impacted areas, providing a total of at least 6.5 HARC AW-score units as compensation for temporary and permanent impacts.

2.1.1.5 Phase 5: Homestead Village North Impacts and Mitigation

The implementation of the Homestead Village North phase would result in 5.2 acres of temporary impacts (all within tributary drainages) and 11.4 acres of permanent impacts (also all within tributary drainages) to jurisdictional resources. Temporary impacts would be restored in

place after the completion of construction. Mitigation for permanent impacts will be provided by applying remaining pre-mitigation credit at Mayo Crossing, and from the implementation of mitigation at upper Long Canyon within the boundaries of the Homestead Village South project area (Figure 9f). The goal is that the functions and values provided by the mitigation at Mayo Crossing, the project-associated mitigation at Long Canyon, and the restored temporary impact areas within the Homestead Village North project would meet or exceed the average HARC score functions and values for the impacted areas, providing a total of at least 7.9 HARC AW-score units as compensation for temporary and permanent impacts.

2.1.1.6 Phase 6: Potrero Village Impacts and Mitigation

The implementation of the Potrero Village phase would result in 6.3 acres of temporary impacts (2.9 acres tributary and 3.4 acres Santa Clara River) and 21.8 acres of permanent impacts (all within tributary drainages) to jurisdictional resources. Temporary impacts would be restored in place after the completion of construction. Mitigation for permanent impacts will be provided by applying mitigation credit remaining from upper Long Canyon and from the implementation of mitigation in lower Long Canyon, Lion Canyon and San Martinez Grande Canyon (Figure 9g). The goal is that the functions and values provided by the project-associated mitigation at upper and lower Long Canyon, Lion Canyon and San Martinez Grande Canyon, and the restored temporary impact areas within the Potrero Village project area, would meet or exceed the average HARC score functions and values for the impacted areas, providing a total of at least 22.5 HARC AW-score units as compensation for temporary and permanent impacts. Although not needed for mitigation credit under this phasing scenario, project-related restoration within Potrero Canyon could provide an additional approximately 70.0 acres of mitigation capacity within the re-constructed drainage channel and 19 acres of cismontane alkali marsh in an area at the lower end of Potrero Canyon.

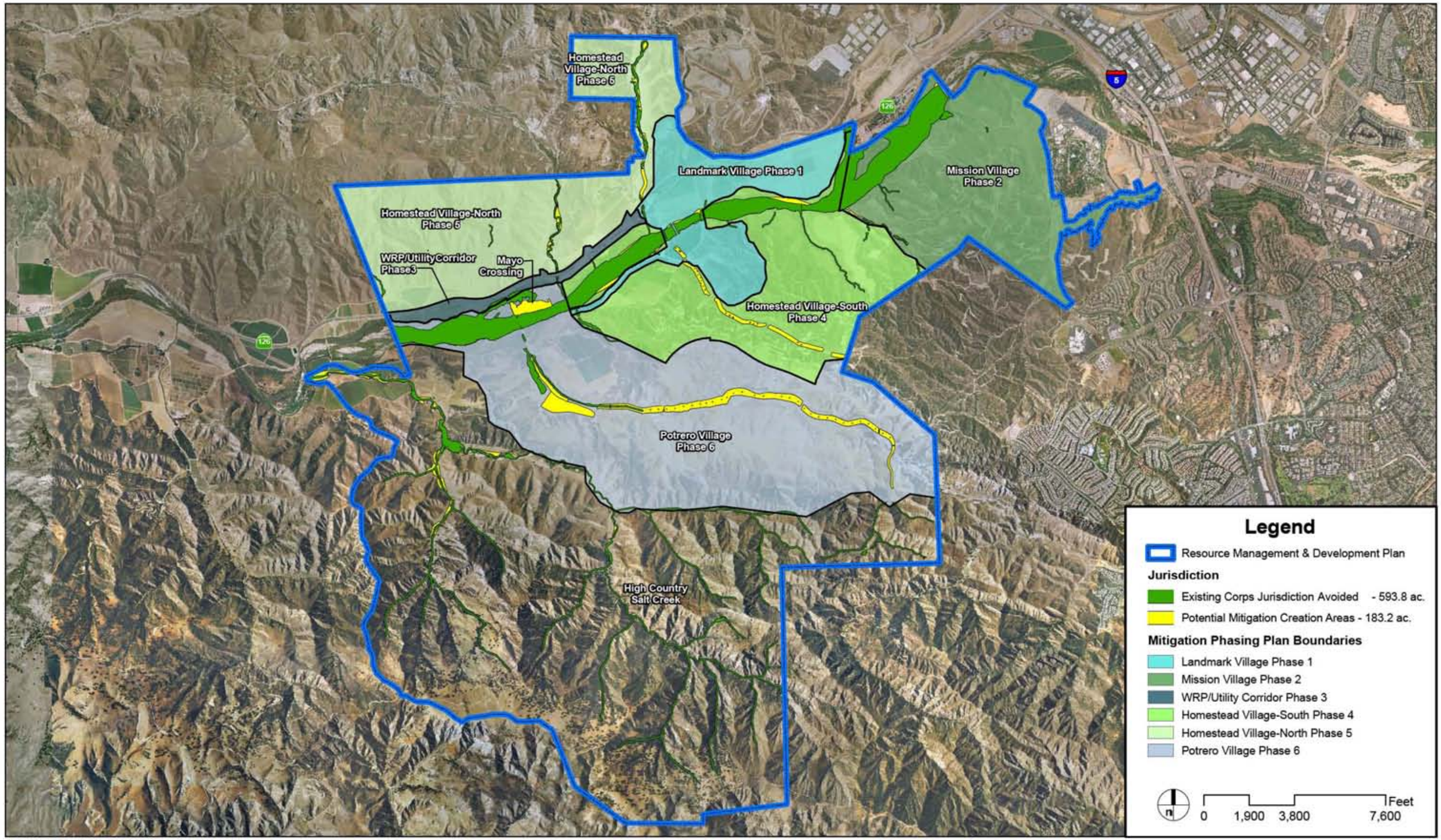
2.2 Functions and Values of the Habitat Types to be Established, Restored, Enhanced and/or Preserved

As explained above, mitigation areas are required to replace the functions and values of the Corps-jurisdictional vegetation communities that are permanently and temporarily impacted. Replacement vegetation communities will be designed to develop composition and structure similar to those of the affected vegetation communities once the replacement vegetation communities have reached mature status.

Mitigation for jurisdictional areas permanently impacted by the Draft LEDPA would generally be designed to include a traditional restoration approach involving grading and site preparation,

seeding, container plant installation, and installation of a temporary irrigation system. Vegetation communities temporarily impacted by the Draft LEDPA would be restored through a combination of passive restoration and varying levels of active restoration, depending on the site conditions. If the project biologist determines that instances of passive restoration are insufficient to eventually reach performance goals after the first year, recommendations will be made to approach the restoration in accordance with the methods designed for permanent impacts (*i.e.*, seeding, container plants, and/or a temporary irrigation system may be recommended). Areas temporarily disturbed by construction activities shall also be maintained annually, as needed, for up to 5 years following construction. These areas shall be monitored annually for 5 years after construction in order to document vegetation community establishment.

The functions and values provided by project mitigation will be evaluated relative to the functions and values of the impact sites prior to construction. Thus, the target functions and values of the mitigation areas correspond with the metrics used in the HARC evaluation methodology, including buffers (*i.e.*, buffer width, buffer condition, land use/land cover), hydrology (*i.e.*, water source, hydroperiod, floodplain connection, surface water persistence or recharge, flood-prone area), habitat physical structure (*i.e.*, topographic complexity, substrate condition), and habitat biotic structure (*i.e.*, vertical biotic structure, interspersion and zonation, ratio of native to non-native plants, riparian vegetation condition, riparian corridor connectivity). The intent of the mitigation program is to provide comparable functions and values at the mitigation sites relative to the impact sites on a drainage by drainage basis.



SOURCE: HUNSAKER 2009/PACE 2009

FIGURE 9a

MITIGATION PLAN PHASES
DRAFT LEDPA POST PROJECT JURISDICTION

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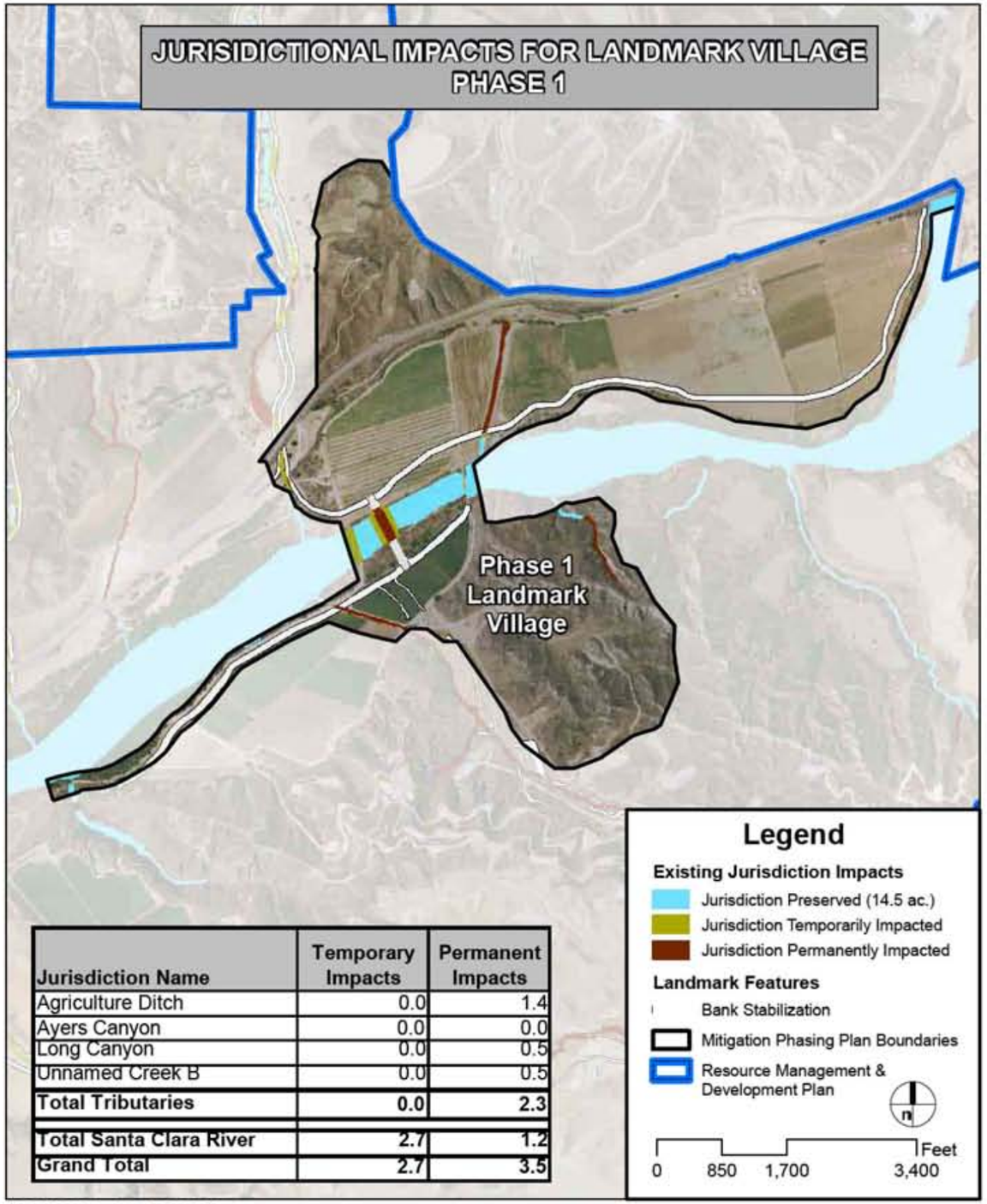
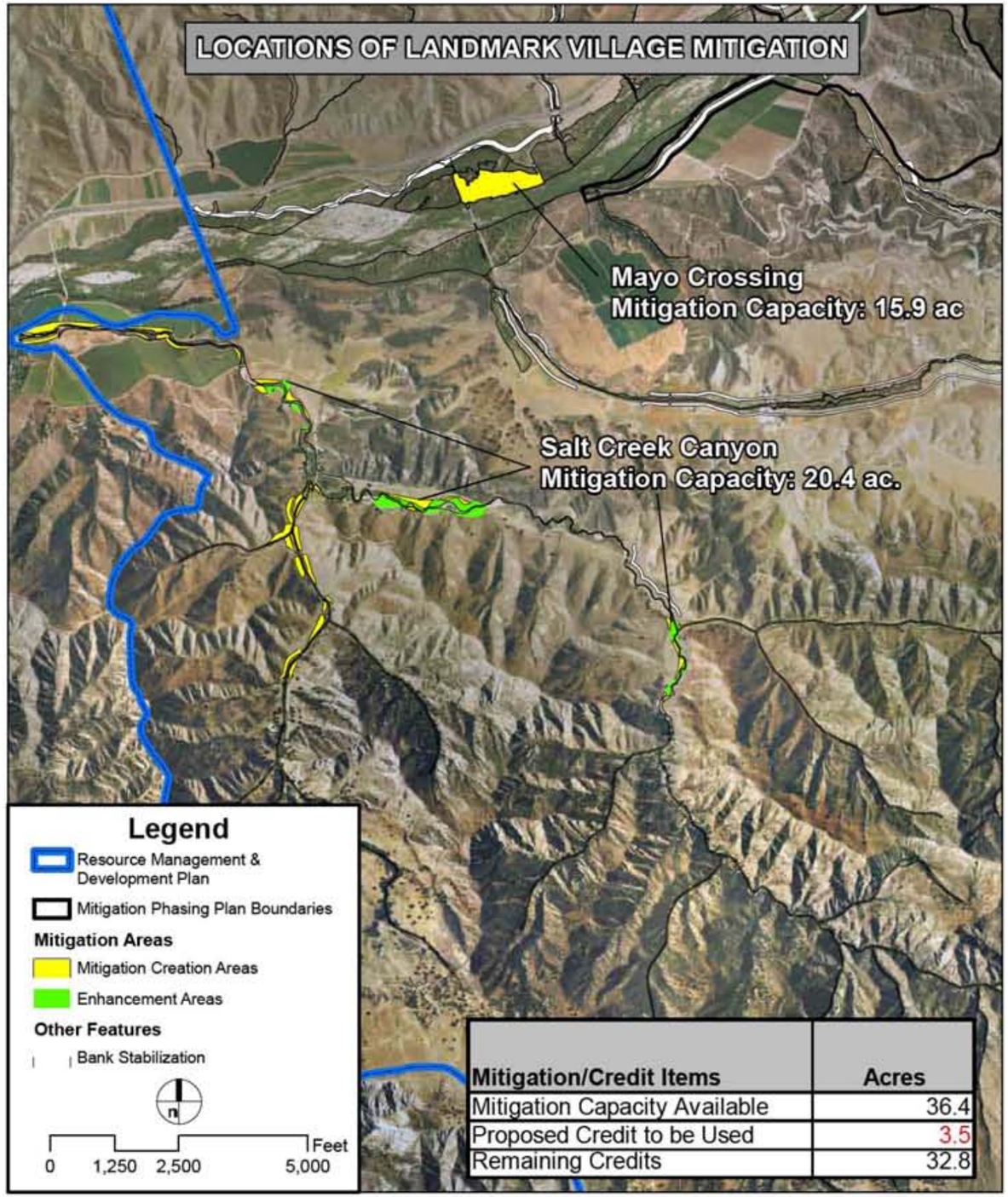


Jurisdiction Name	Temporary Impacts	Permanent Impacts
Agriculture Ditch	0.0	1.4
Ayers Canyon	0.0	0.0
Long Canyon	0.0	0.5
Unnamed Creek B	0.0	0.5
Total Tributaries	**0.0**	**2.3**
Total Santa Clara River	**2.7**	**1.2**
Grand Total	**2.7**	**3.5**



Mitigation/Credit Items	Acres
Mitigation Capacity Available	36.4
Proposed Credit to be Used	3.5
Remaining Credits	32.8

SOURCE: PACE 2009

FIGURE 9b

MITIGATION PLAN PHASE 1
DRAFT LEDPA LANDMARK VILLAGE PHASE

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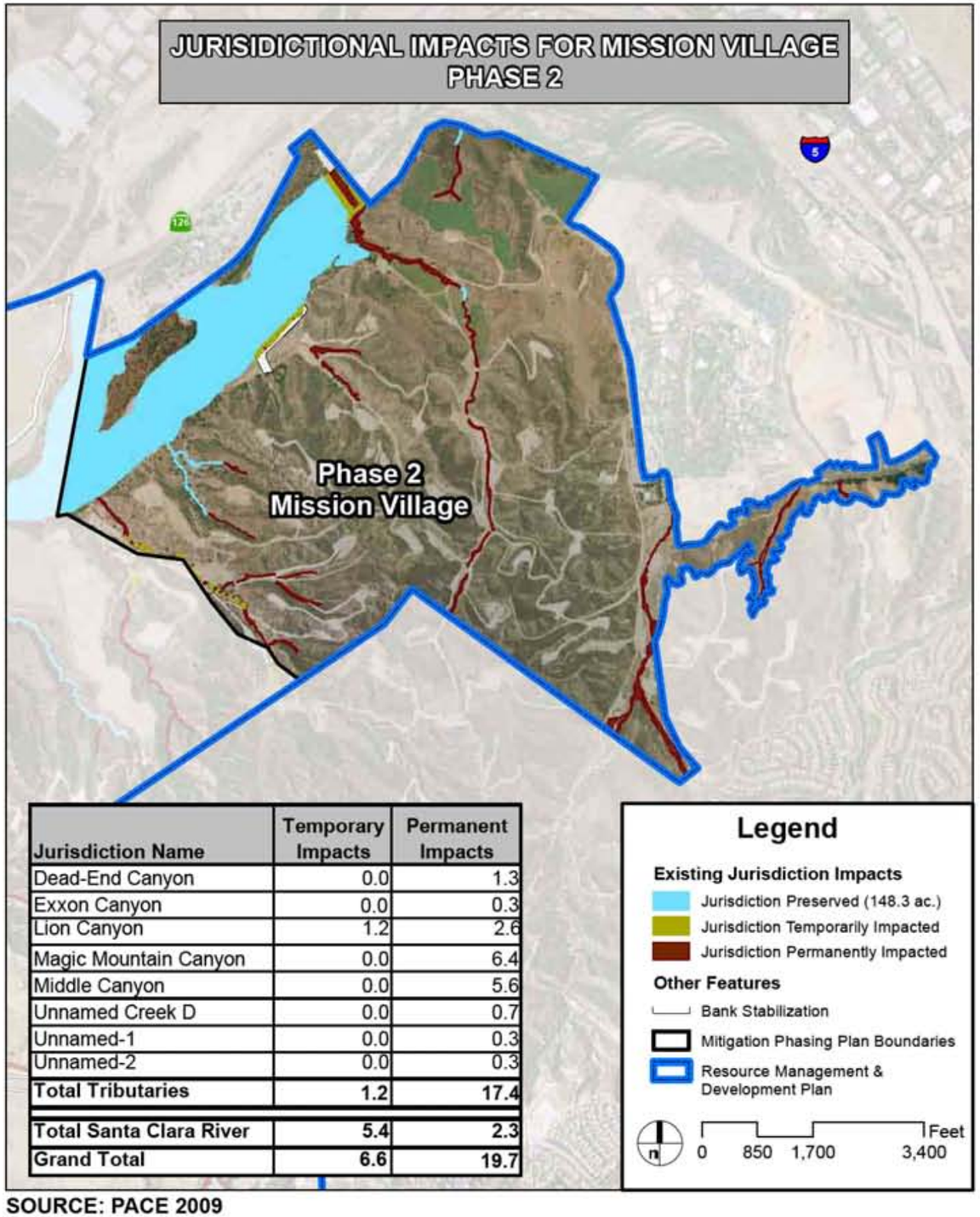
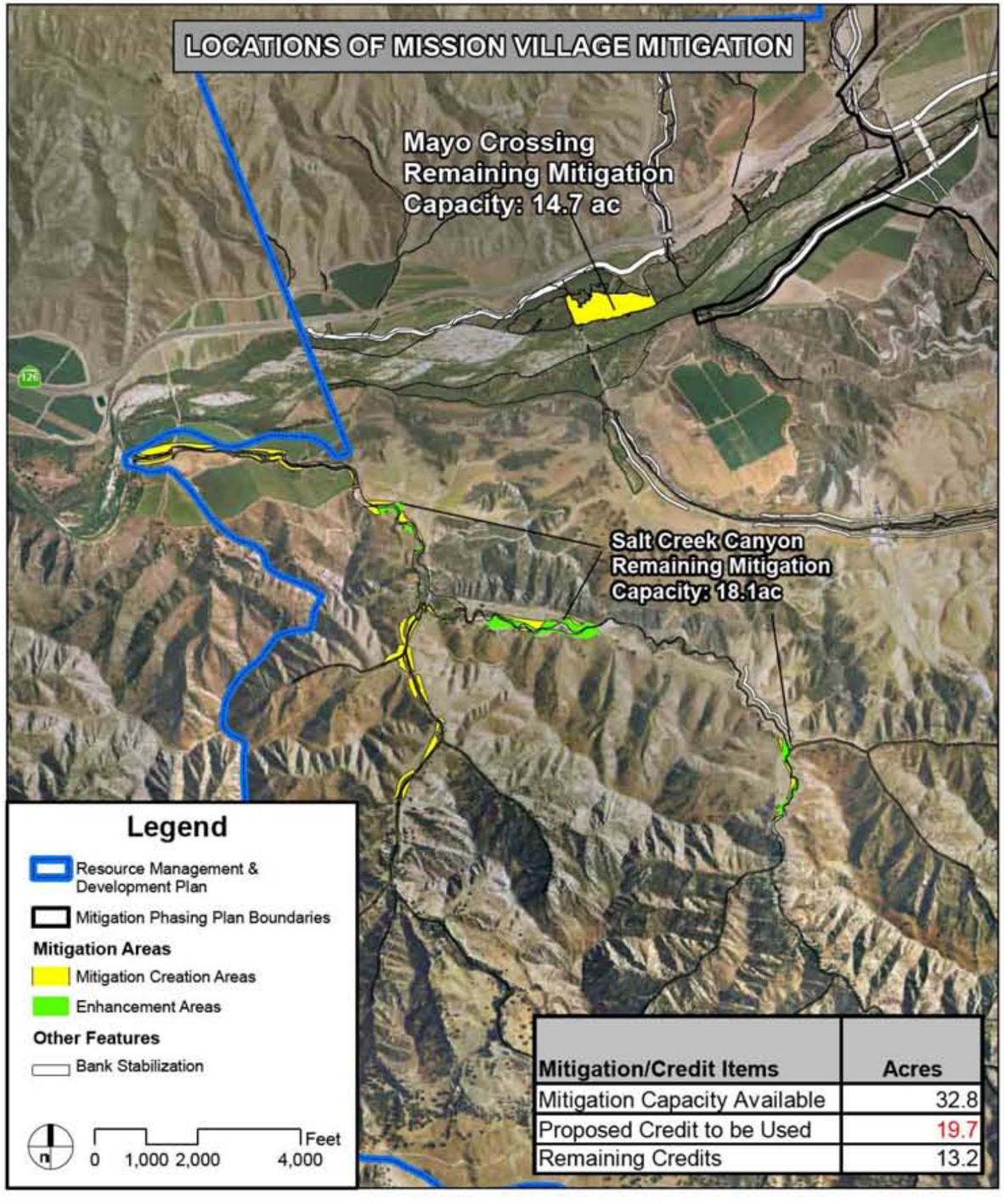


Jurisdiction Name	Temporary Impacts	Permanent Impacts
Dead-End Canyon	0.0	1.3
Exxon Canyon	0.0	0.3
Lion Canyon	1.2	2.6
Magic Mountain Canyon	0.0	6.4
Middle Canyon	0.0	5.6
Unnamed Creek D	0.0	0.7
Unnamed-1	0.0	0.3
Unnamed-2	0.0	0.3
Total Tributaries	**1.2**	**17.4**
Total Santa Clara River	**5.4**	**2.3**
Grand Total	**6.6**	**19.7**



Mitigation/Credit Items	Acres
Mitigation Capacity Available	32.8
Proposed Credit to be Used	19.7
Remaining Credits	13.2

SOURCE: PACE 2009

FIGURE 9c

MITIGATION PLAN PHASE 2
DRAFT LEDPA MISSION VILLAGE PHASE

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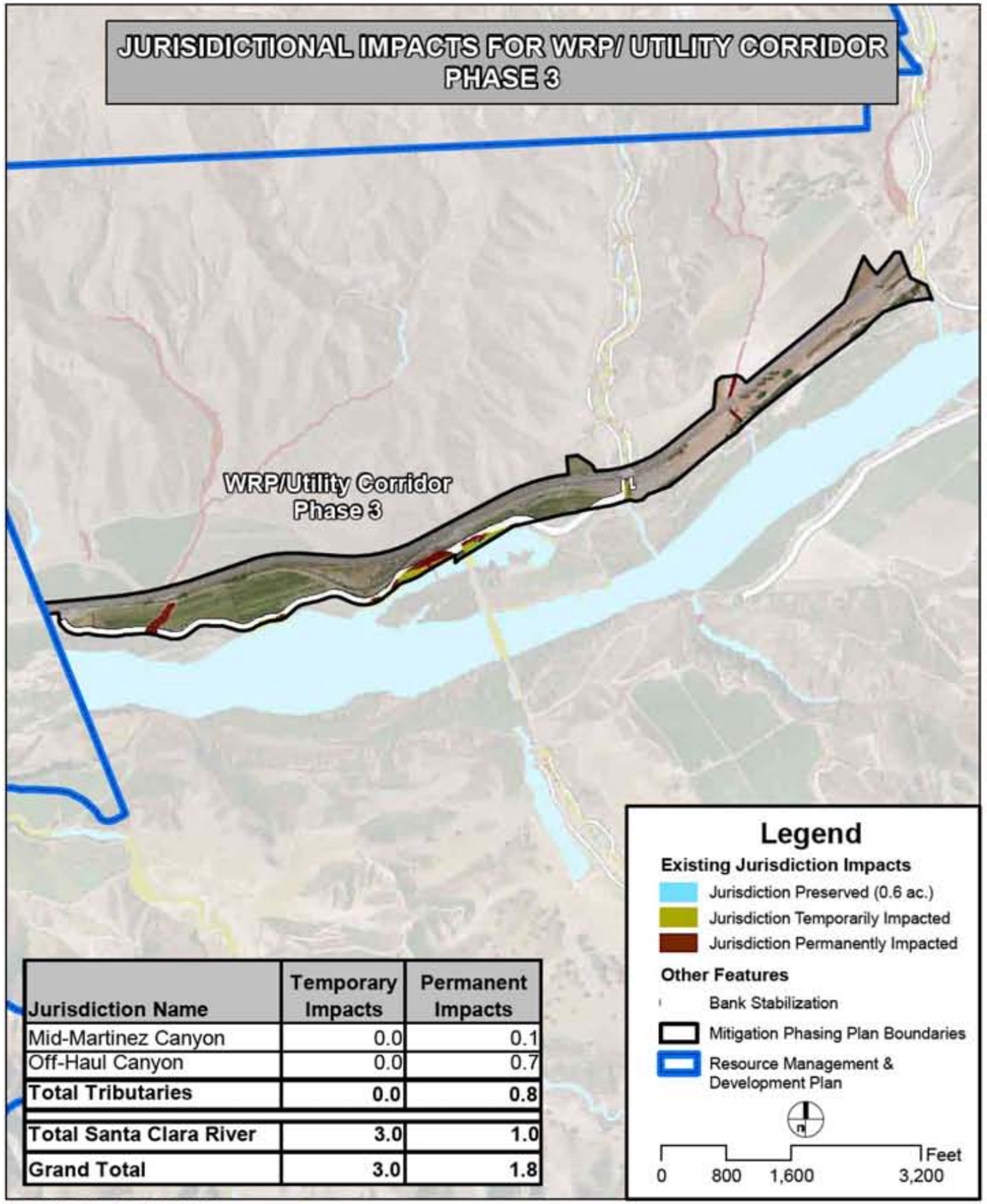
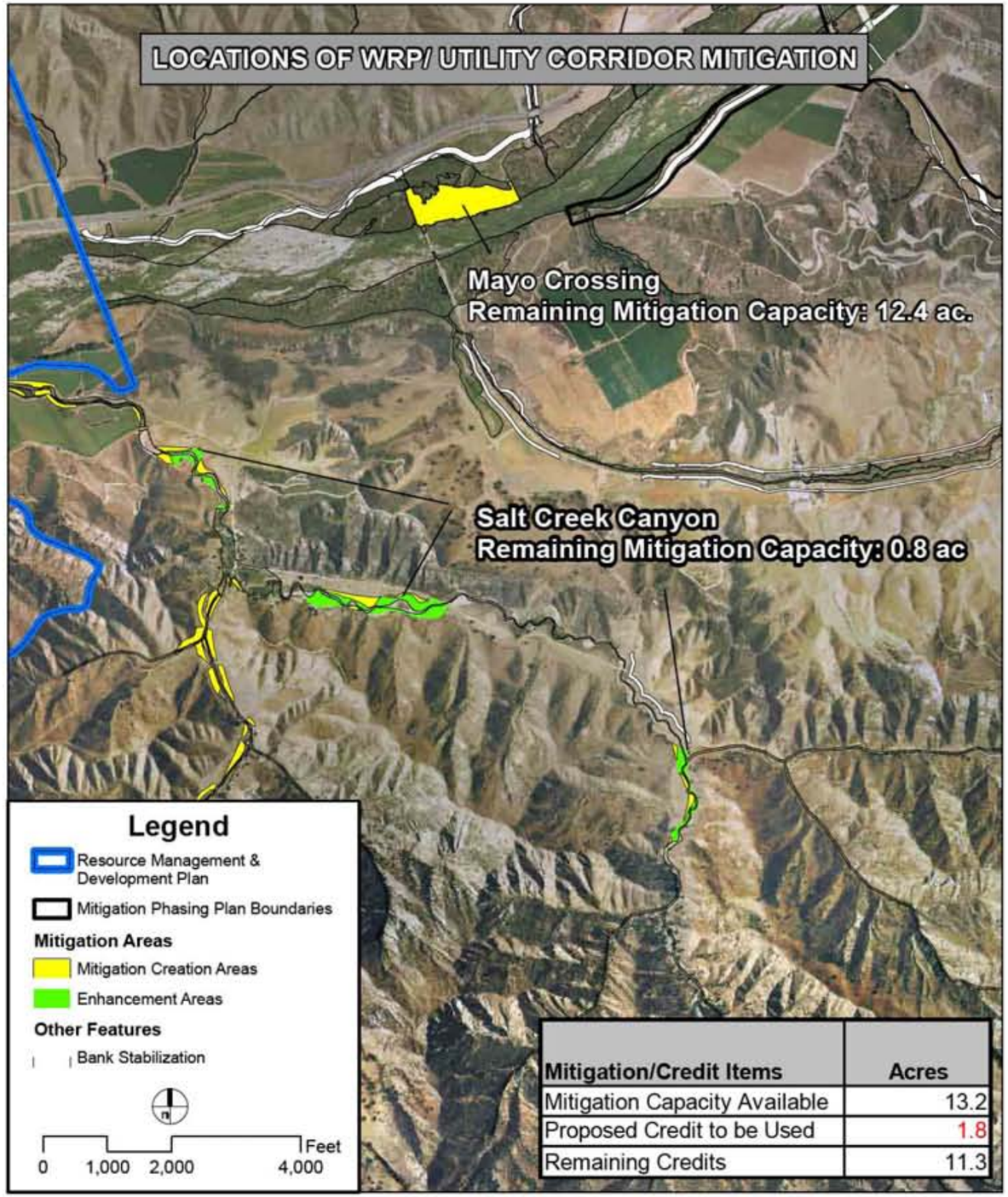


Jurisdiction Name	Temporary Impacts	Permanent Impacts
Mid-Martinez Canyon	0.0	0.1
Off-Haul Canyon	0.0	0.7
Total Tributaries	**0.0**	**0.8**
Total Santa Clara River	**3.0**	**1.0**
Grand Total	**3.0**	**1.8**



Mitigation/Credit Items	Acres
Mitigation Capacity Available	13.2
Proposed Credit to be Used	1.8
Remaining Credits	11.3

SOURCE: PACE 2009

FIGURE 9d

MITIGATION PLAN PHASE 3
DRAFT LEDPA WRP/ UTILITY CORRIDOR PHASE

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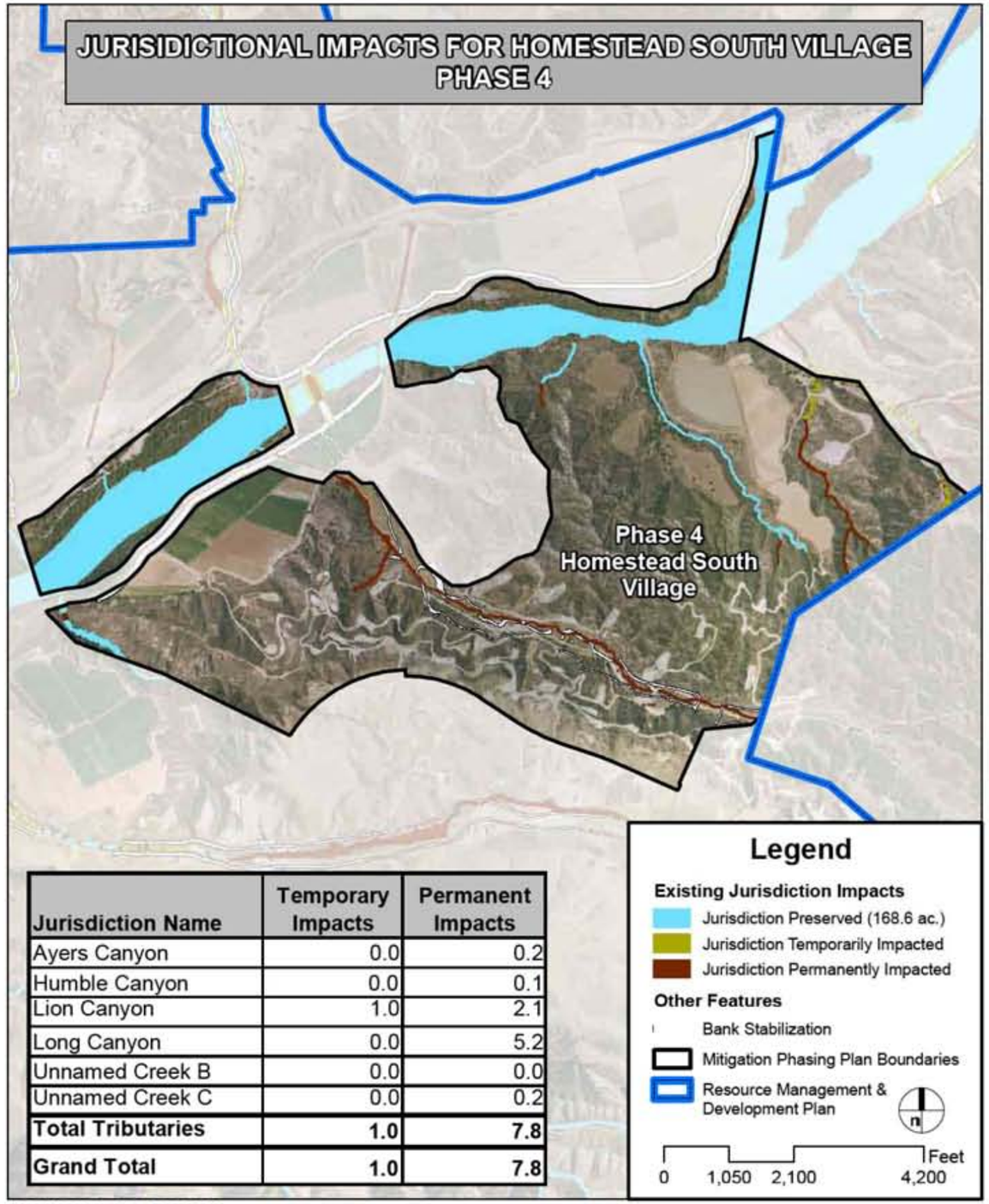
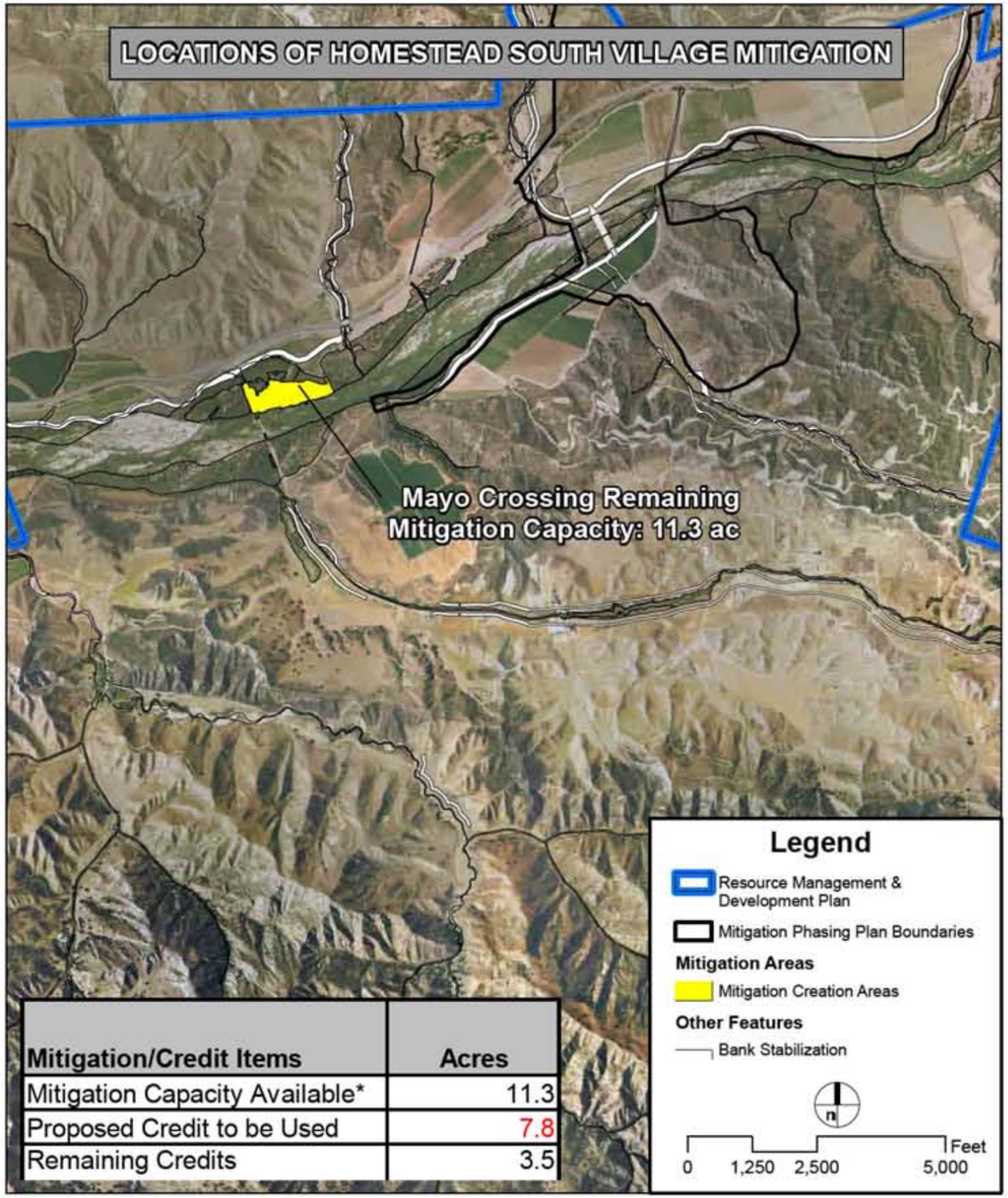


Jurisdiction Name	Temporary Impacts	Permanent Impacts
Ayers Canyon	0.0	0.2
Humble Canyon	0.0	0.1
Lion Canyon	1.0	2.1
Long Canyon	0.0	5.2
Unnamed Creek B	0.0	0.0
Unnamed Creek C	0.0	0.2
Total Tributaries	**1.0**	**7.8**
Grand Total	**1.0**	**7.8**



Mitigation/Credit Items	Acres
Mitigation Capacity Available*	11.3
Proposed Credit to be Used	7.8
Remaining Credits	3.5

SOURCE: PACE 2009

FIGURE 9e

MITIGATION PLAN PHASE 4
DRAFT LEDPA HOMESTEAD SOUTH PHASE

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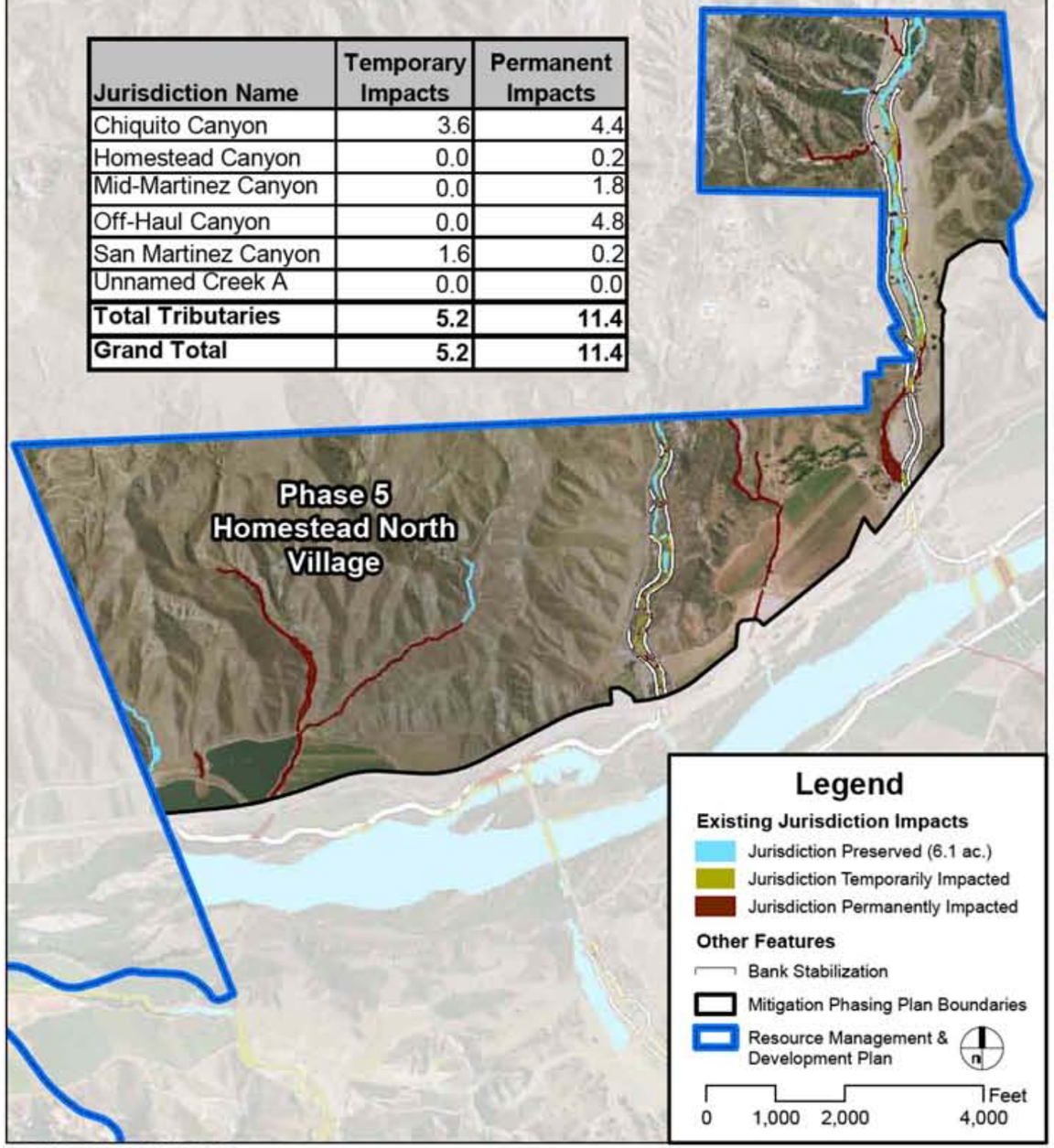
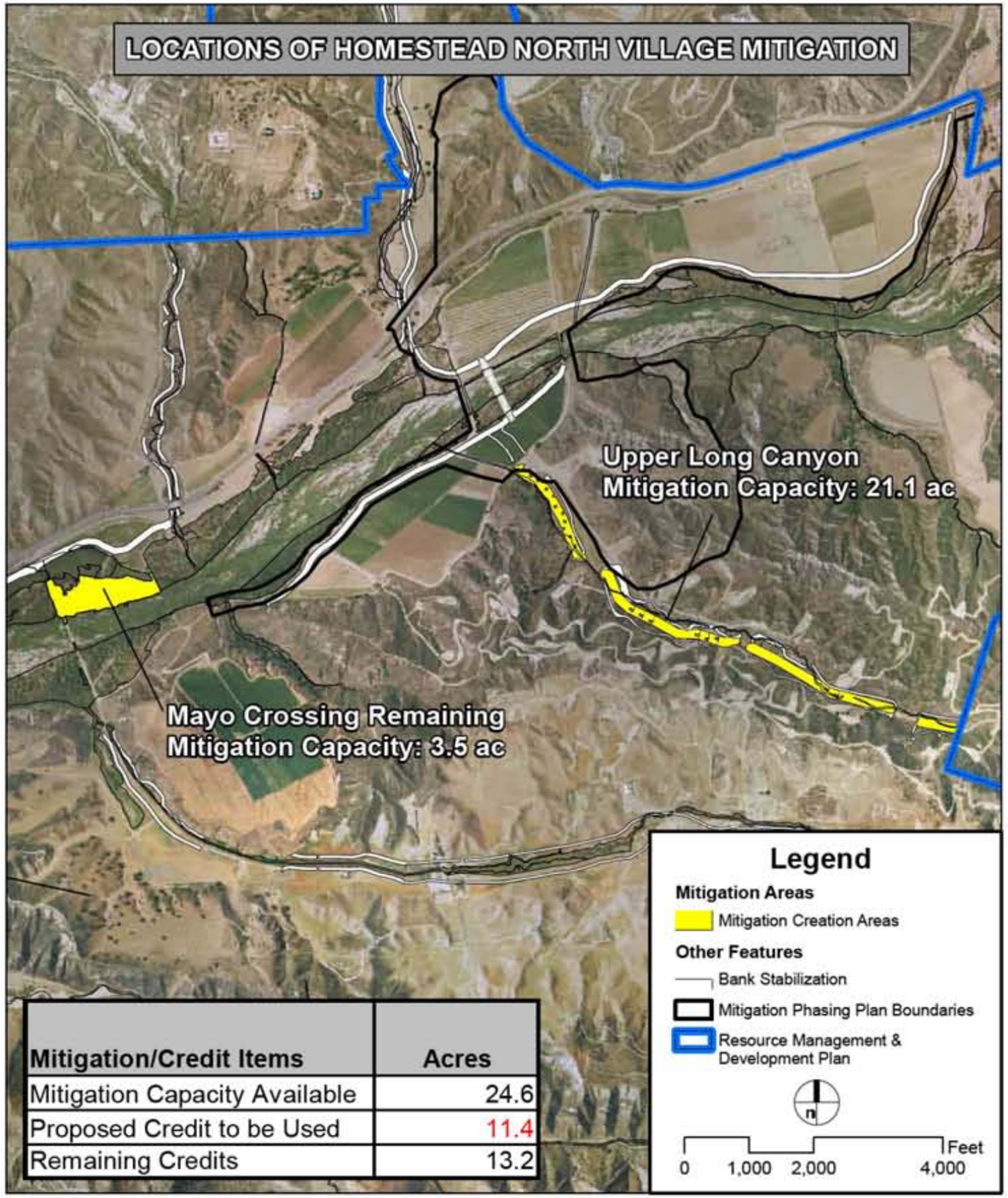
JURISIDICTIONAL IMPACTS FOR HOMESTEAD NORTH VILLAGE PHASE 5

Jurisdiction Name	Temporary Impacts	Permanent Impacts
Chiquito Canyon	3.6	4.4
Homestead Canyon	0.0	0.2
Mid-Martinez Canyon	0.0	1.8
Off-Haul Canyon	0.0	4.8
San Martinez Canyon	1.6	0.2
Unnamed Creek A	0.0	0.0
Total Tributaries	**5.2**	**11.4**
Grand Total	**5.2**	**11.4**



LOCATIONS OF HOMESTEAD NORTH VILLAGE MITIGATION



Mitigation/Credit Items	Acres
Mitigation Capacity Available	24.6
Proposed Credit to be Used	11.4
Remaining Credits	13.2

SOURCE: PACE 2009

FIGURE 9f

MITIGATION PLAN PHASE 5
DRAFT LEDPA HOMESTEAD NORTH VILLAGE PHASE

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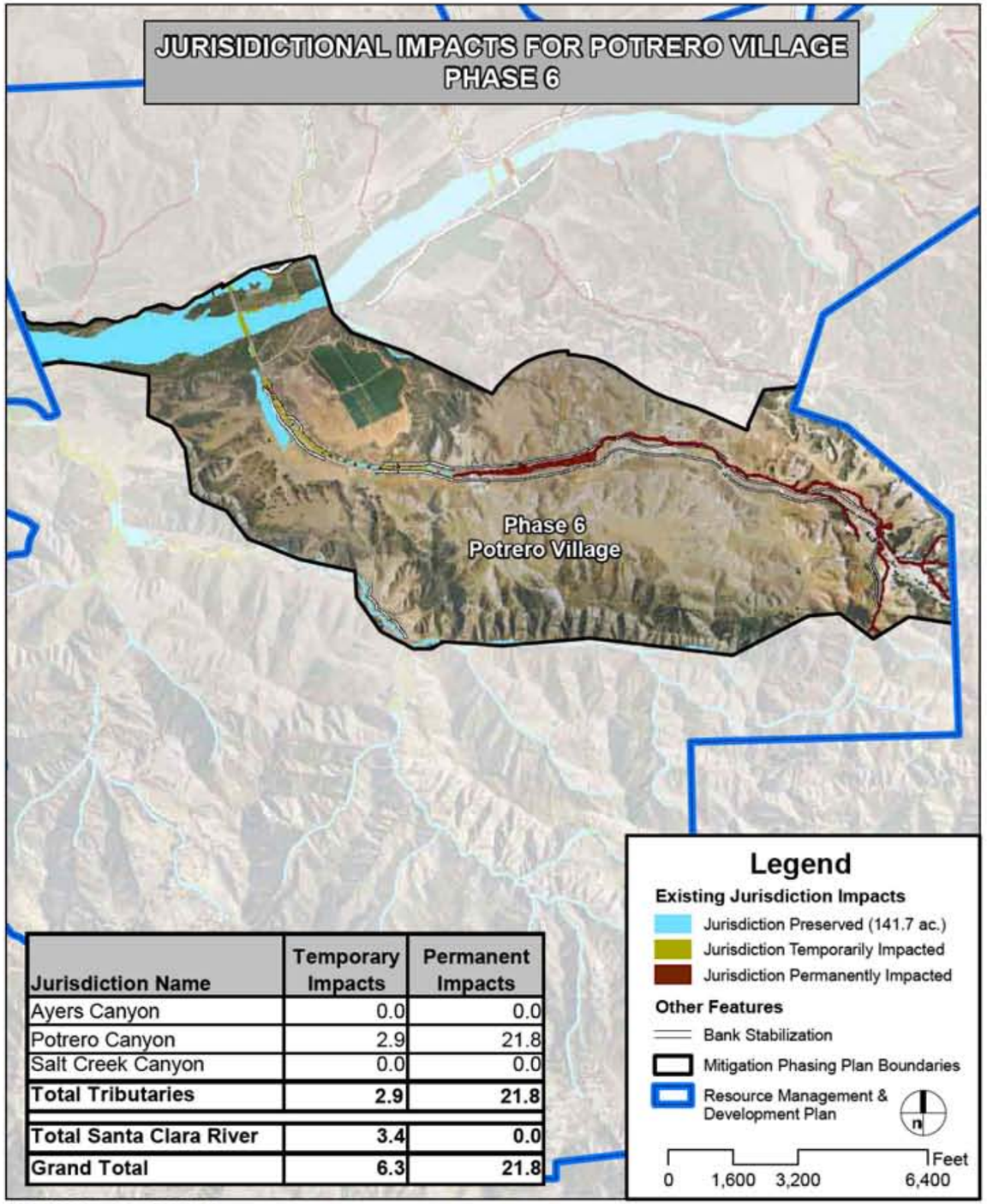
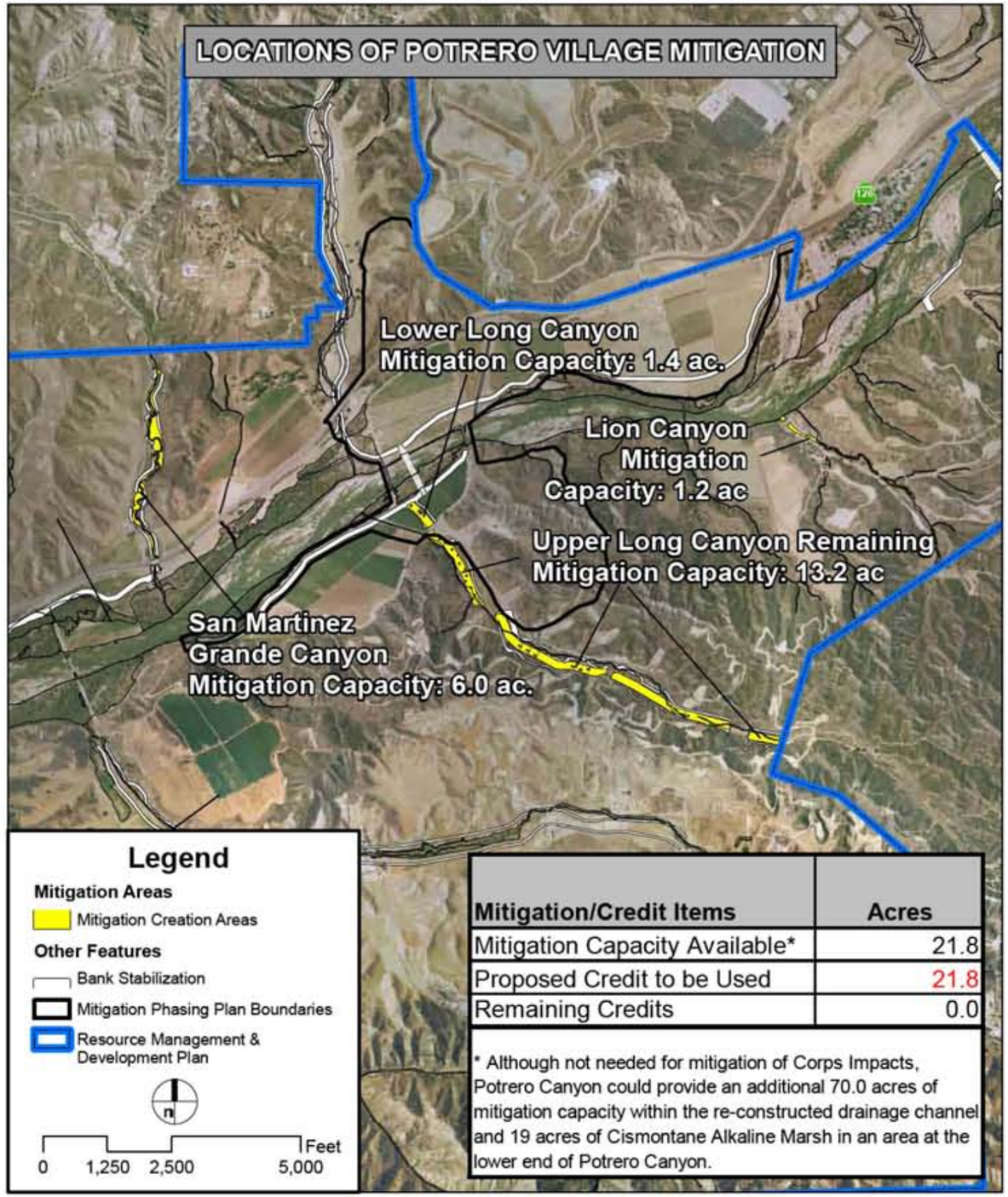


Jurisdiction Name	Temporary Impacts	Permanent Impacts
Ayers Canyon	0.0	0.0
Potrero Canyon	2.9	21.8
Salt Creek Canyon	0.0	0.0
Total Tributaries	**2.9**	**21.8**
Total Santa Clara River	**3.4**	**0.0**
Grand Total	**6.3**	**21.8**



Mitigation/Credit Items	Acres
Mitigation Capacity Available*	21.8
Proposed Credit to be Used	21.8
Remaining Credits	0.0

* Although not needed for mitigation of Corps Impacts, Potrero Canyon could provide an additional 70.0 acres of mitigation capacity within the re-constructed drainage channel and 19 acres of Cismontane Alkaline Marsh in an area at the lower end of Potrero Canyon.

SOURCE: PACE 2009

FIGURE 9g

MITIGATION PLAN PHASE 6
DRAFT LEDPA POTRERO VILLAGE PHASE

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2.2.1 Tributary Drainages

Within the tributary drainages in the RMDP study area, certain drainages would not be graded and would remain undisturbed, while other drainage areas would be graded, reconstructed to a soft-bottom drainage channel with buried bank stabilization along each side of the drainage, or converted to a buried storm drain (Figure 8, Draft LEDPA Modified, Converted and Preserved Tributary Drainages). Reconstructed drainage areas would integrate flood control and grade-stabilizing measures (*i.e.*, a combination of drop structures/grade stabilizers and bank stabilization) to maintain sediment equilibrium and protect the channel bed and banks from hydromodification impacts. This design methodology is intended to create stable drainage channels that would support in-channel native habitats following project implementation. The approach focuses on developing channel width, depth, slope, and other parameters based on the future flow and sediment regime of each drainage, using an integrated approach that predicts stable characteristics and that uses structures and other measures only in those drainage locations where erosional forces would exceed the natural stability of the drainage channel. All such structures (*i.e.*, bank and channel bed stabilization) are designed to mimic natural features and use a combination of structural and vegetative methods to provide drainage channels that are stable and visually aesthetic, and that provide for the desired habitat (*i.e.*, riparian, wetland, and upland) with minimal maintenance required after project implementation. Road-crossing culverts and bridges would cross various drainages, but only where necessary to accommodate the approved Specific Plan circulation system. Modified drainage/jurisdiction includes stabilized and engineered tributary drainages that are revegetated, and areas where new drainage/jurisdiction are being created.

The design approach for mitigation at the tributary canyons is a general treatment of on-site impacts to tributary drainages that flow through the site. Restoration strategies for impacts to tributary drainages will be designed to reintroduce and establish self-sustaining vegetation communities commensurate with the level of disturbance or loss within each canyon. The individual site designs will provide a response to post-construction hydrology, channel morphology, and other environmental factors that may be altered by development.

The drainages within these canyons are primarily intermittent and ephemeral. The vegetation communities supported by the tributaries typically include big sagebrush scrub, alluvial scrub, mulefat scrub, arrow weed scrub, and southern willow scrub. These vegetation communities tend to occur at low densities, except for arrow weed scrub, which can develop dense monotypic stands. Small isolated patches of southern cottonwood–willow riparian forest and coast live oak riparian woodland are present where the soil substrate and hydraulic support are appropriate. Occasional individual cottonwoods and oaks are also found along these drainages.

Intermittent drainages may concentrate sufficient runoff to support the presence of mesic wetland vegetation communities such as southern willow scrub and southern cottonwood–willow riparian forest. Ephemeral drainages generally lack sufficient runoff to support mesic wetland vegetation and are more likely to support vegetation communities that reflect these drier conditions. Along this hydraulic gradient are found, in order of wetter to drier, mulefat scrub, arrow weed scrub, big sagebrush scrub, and alluvial scrub. River wash is present in the driest conditions, especially where soil substrates have high permeability.

Restoration Strategies

Development within each canyon would result in various degrees of impact to the canyon environment, including (1) complete fill of the stream channel, (2) stream channel stabilization, and (3) newly created stream channel. Each of these post-construction scenarios is addressed in terms of opportunities and constraints to maintaining pre-construction functions and values. It is anticipated that the entire channel widths as designed may not result in Corps-jurisdictional area, but that the Corps-jurisdictional drainage feature would result in a braided or serpentine primary channel within the larger constructed drainage complex. At the current design level, the channel designs do not specify where and how wide the primary channels within the drainage feature would be. It is anticipated that this will be an aspect of the final designs for each individual, site-specific final mitigation plan.

Channel Stabilization

The means to stabilize tributary channels present opportunities to establish a greater diversity of vegetation communities, because stabilization features often have a secondary effect of capturing and concentrating runoff at specific locations. The resident time of water behind these structures may be sufficient to support more mesic hydrophytic vegetation, such as southern willow scrub, and individual trees, such as cottonwood. The mitigation design will take full advantage of these conditions to maximize functions and values by planning for a variety of vegetation communities that reflect the hydrology that is associated with these stabilized channels.

Establishment would include selected container plantings and cuttings of wetland species. A native seed mix of appropriate species that are common to the various vegetation communities would be applied to these sites in accordance with the environmental tolerances and natural distribution of the vegetation community. Other features such as wattled live cuttings may be employed in association with channel stabilization features, such as grade control devices and basins, or as stand-alone stabilization features, depending upon anticipated flow velocities.

A temporary irrigation system would be utilized to provide early establishment of native vegetation and as a hedge against winter drought. The irrigation system may be attached to a potable water system that is associated with new development or operated with a water truck hook-up. Maintenance and monitoring would be conducted over a 5-year period to guide the emerging vegetation toward established performance criteria. These criteria would be based on the quality of vegetation impacted.

Complete Fill of Channels and Newly Created Channels

Some development scenarios would cause tributary drainages to be relocated horizontally and/or vertically from the existing drainage alignment in order to accommodate construction techniques that are necessary to stabilize the development area. In these cases, the mitigation would be designed in tandem with the recreated drainage channel. The design process would allow for the creation of a variety of channel features that can support diverse wetland vegetation communities that replace impacted functions and values. Channel design can recreate a variety of flow gradients that support various vegetation communities. Channel features such as creek terraces can isolate mitigation areas where net evaporation is needed to support hypersaline conditions. The control of soil substrate would allow for the installation of low permeable layers that perch groundwater to create localized wetland areas. Soil salvage may be used when on-site soils are unique and conducive to the establishment of specific vegetation types.

A variety of installation techniques may be used to establish vegetation communities, depending upon the most successful propagules of each species. These may take the form of container plants, live cuttings (individual and wattled), and seeds.

A temporary irrigation system would be utilized to provide early establishment of native vegetation and as a hedge against winter drought. The irrigation system may be attached to a potable system that is associated with new development or operated with a water truck hook-up. Maintenance and monitoring would be conducted over a 5-year period to guide the emerging vegetation toward established performance criteria. These criteria will be based on the quality of vegetation impacted.

2.2.2 Pre-Mitigation at Salt Creek and Mayo Crossing

Pre-mitigation includes mitigation within the Salt Creek drainage and High Country SMA/SEA 20 area and within an area adjacent to the Santa Clara River at Mayo Crossing that would be implemented in advance of, or concurrent with, development impacts (Figures 10 and 11).

Salt Creek and High Country SMA/SEA 20

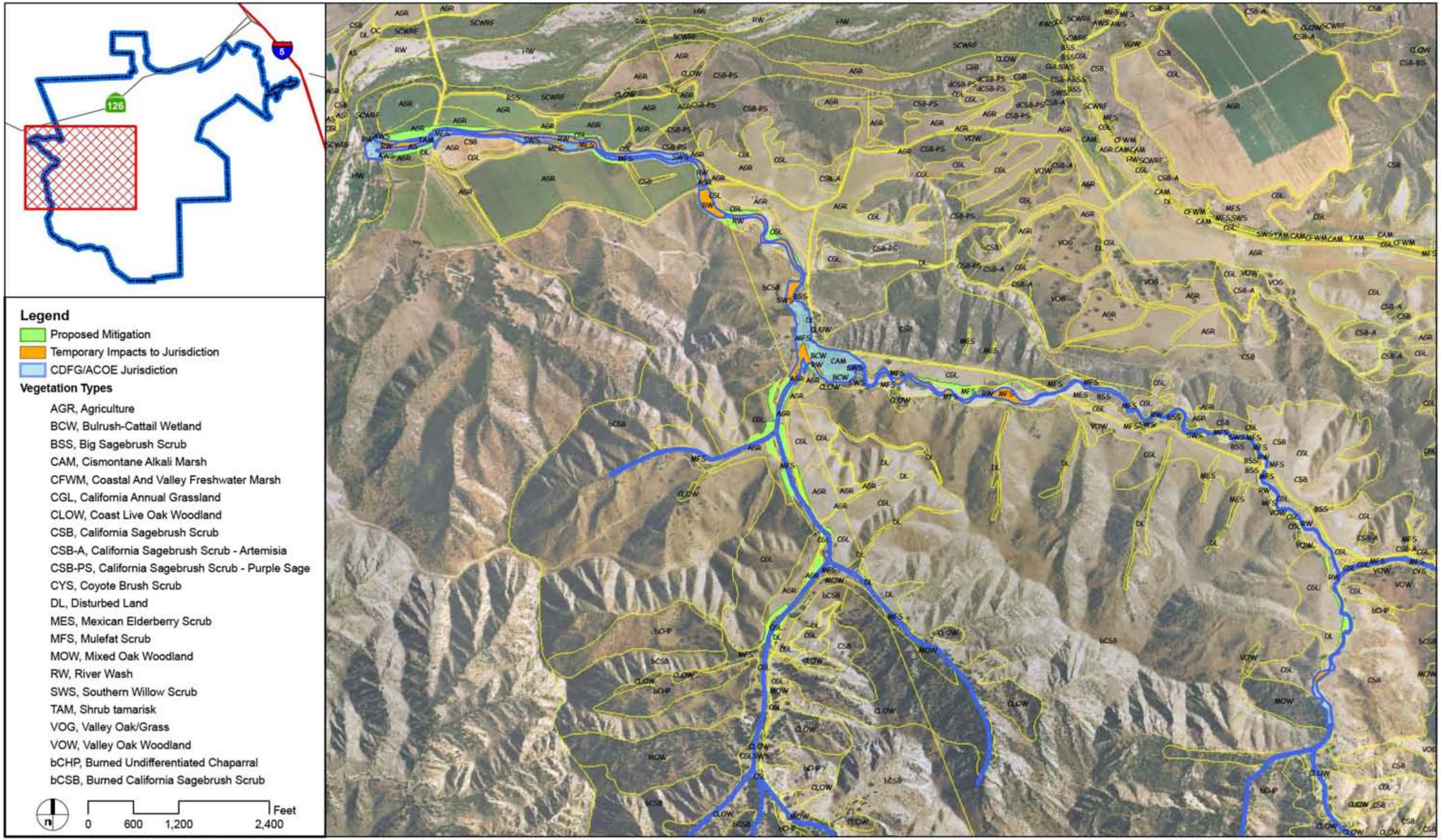
Mitigation opportunities within the Salt Creek drainage and High Country SMA/SEA 20 were described in the Revised Draft Newhall Mitigation Feasibility Study (Dudek 2007) and are briefly summarized here. Within the Salt Creek drainage and High Country SMA/SEA 20, Dudek considered three types of jurisdictional area mitigation potential: enhancement, stream bank stabilization, and creation.

Enhancement activities would be conducted in conjunction with stream bank stabilization and creation to improve the functions and values of the mitigation site. Enhancement would include control of non-native invasive species and establishment of native species within Corps-jurisdictional areas. In the Salt Creek drainage and many of the other tributary drainages, tree tobacco and salt cedar (*Tamarix* spp.) were prevalent, occupying up to 50% of the shrub cover in some areas, with most areas having around 10% cover of non-native plants. Grade modifications would not be required to accomplish enhancement, although some areas may undergo grade modification in association with creation and/or stream bank stabilization efforts.

Structural stream bank restoration (*e.g.*, biostabilization) is planned in several locations within the Salt Creek drainage area and High Country SMA/SEA 20. Structural stream bank restoration is particularly important in regions of the drainage where the stream buffers are used for agriculture or are heavily grazed and/or composed of non-native vegetation. Structural stream bank restoration would require extensive grading in most areas to change the angle of the stream banks such that they could support vegetation, and would require stream bank and streambed stabilization structures (*e.g.*, gabions, riprap, articulated concrete block), in addition to vegetation, to hold the soil on the banks in place.

Creation opportunities within the Salt Creek drainage area and High Country SMA/SEA 20 primarily include channel margins where stream bank stabilization is planned. After stream bank stabilization restoration is completed, the lower portions of channel banks would be suitable for establishment of hydrophytic vegetation for biostabilization. All instances of creation would require grading and contouring to establish appropriate elevations to introduce hydrology.

Overall, pre-mitigation in the Salt Creek drainage area and High Country SMA/SEA 20 is expected to create approximately 20.4 acres of jurisdictional area as pre-mitigation for impacts of subsequent development phases. Mitigation areas would be maintained and monitored for a 5-year period to document success.



SOURCE: HUNSAKER 2009/PACE 2009

FIGURE 10

Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch RMDP

Salt Creek Canyon Mitigation

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FIGURE 11

Draft Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch Resource Management and Development Plan

Mayo Crossing Mitigation

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Mayo Crossing

The planned mitigation site at Mayo Crossing includes an area along the northern margin of the Santa Clara River that is in agricultural use. The site is surrounded by wetland and riparian habitat associated with the Santa Clara River, with the main river channel to the south and a secondary river channel to the north. Due to its location within the floodplain of the Santa Clara River, the site is an ideal location to establish Corps-jurisdictional area. The entire area is planned as Corps-jurisdictional wetlands.

The design approach includes grade modification through soil excavation to establish elevations and contours appropriate for hydrologic influence from the Santa Clara River. With the establishment of target elevations comparable to the existing elevations within the associated braided channels of the Santa Clara River, it is anticipated that hydrophytic vegetation would develop with only limited intervention. A combination of passive and active restoration with 5 years of maintenance and monitoring is planned. Vegetative communities likely to establish include those that surround the site, such as southern cottonwood-willow riparian forest, arrow weed scrub, mulefat scrub, river wash, and/or herbaceous wetlands.

Overall, pre-mitigation in the Mayo Crossing area is expected to create approximately 15.9 acres of jurisdictional area as mitigation for impacts of subsequent development phases. Mitigation areas would be maintained and monitored for a 5-year period to document success.

2.2.3 Phase 1: Landmark Village

The planned mitigation within the boundaries of the Landmark Village development phase would include creation, restoration, and enhancement. The planned creation sites at Landmark Village are in Chiquito Canyon (southern portion) and Long Canyon (northern portion) (Figure 12, Chiquito Canyon Mitigation and Figure 13, Long Canyon Mitigation).

Mitigation at Landmark Village would include reestablishing the lower (downstream) portions of the drainages in Chiquito Canyon and in Long Canyon after they are filled. Portions of the drainage channels must be filled to facilitate the proposed design strategy for the development at this location. The majority of drainage modifications to Long and Chiquito canyons will occur within subsequent phases, including Phase 4 Homestead Village South (for Long Canyon) and Phase 5 Homestead Village North (for Chiquito Canyon). More specific details about the channel design modifications are included within the descriptions for those phases below. In general, the channels will be designed to support a similar complex of native vegetation communities as those that currently occur. A detailed, site-specific mitigation design will be developed during

the design phase, allowing for the creation of a variety of channel features to support diverse vegetation communities to replace impacted functions and values. The restoration approach may rely on the use of a temporary irrigation system and plant materials (seed and container plants) to establish vegetation.

Temporary Corps-jurisdictional impacts would be mitigated through restoration of vegetation communities at the temporary impact site that is equivalent to the impacted vegetation. The intent of restoration of temporary Corps-jurisdictional impact areas is to restore the areas to support the same vegetation communities that were there prior to impacts. The critical design feature for achievement of this goal is post-construction recontouring to ensure that the temporary impact areas are restored to pre-impact elevations and contours. Successful recontouring following construction would reestablish the hydrologic connections and/or groundwater relationship that existed prior to construction.

The mitigation design may also incorporate enhancement of existing wetland vegetation communities to improve functions and values of the mitigation site. Enhancement would include control of non-native invasive species and establishment of native species. Non-native invasive species that are prevalent within portions of the Landmark Village site include giant reed (*Arundo donax*), salt cedar, and tree tobacco. Appropriate control methods for the targeted invasive species would be implemented and then, once controlled, followed up with a combination of passive and active restoration techniques (seeding/planting). Grading and the installation of temporary irrigation systems are not anticipated for wetland enhancement areas. No specific enhancement areas have been identified for use as mitigation at this time.

The Landmark Village area includes the Lower Chiquito Canyon mitigation area, which is expected to create approximately 2.9 acres of jurisdictional area and the Lower Long Canyon mitigation area, which is expected to create approximately 1.4 acres of jurisdictional area. Additionally, mitigation would include restoration of 2.7 acres of Corps-jurisdictional area as mitigation for temporary impacts of Phase 1. Mitigation areas would be maintained and monitored for a 5-year period to document success.

2.2.4 Phase 2: Mission Village

Mitigation at the Mission Village site will include restoration and creation associated with the drainage channel reconfiguration in Lion Canyon. Impacts to jurisdictional areas would occur in the tributary canyons within the Mission Village project boundaries. The general design concepts for the mitigation features in Mission Village are discussed briefly below and depicted in Figure 14, Lion Canyon Mitigation.

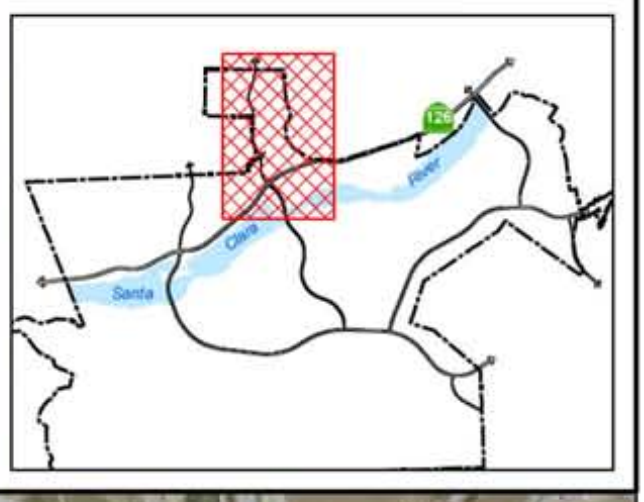
Legend

- Resource Management & Development Plan
- Mitigation Phasing Plan Boundaries
- Existing Jurisdiction Boundary
- Preserved CDFG Only Jurisdiction - 2.10 ac.
- Preserved CDFG & ACOE Jurisdiction - 7.83 ac.
- Bank Stabilization
- New Upland Buffer - 5.0 ac.
- Newly Created Jurisdiction - 17.2 ac.
- Proposed Grading
- Roads

N

0 300 600 1,200 Feet

APPROXIMATE SCALE IN FEET



Phase 5 Homestead Village-North

Bridge Impact to Jurisdiciton: 0.11 Acres

Road Impacts to Jurisdiction: 0.15 Acres

Road Impacts to Jurisdiction: 0.08 Acres

126

Phase 1 Landmark Village

SR-126 Bridge Widening

Phase 3 WRP-Utility Corrdior

SANTA CLARA RIVER

Phase 4 Homestead Village-South

SOURCE: PACE 2010

Note: Location of drop structures/grade stabilizers are approximate.

FIGURE 12

Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch RMDP

CHIQUITO CANYON MITIGATION

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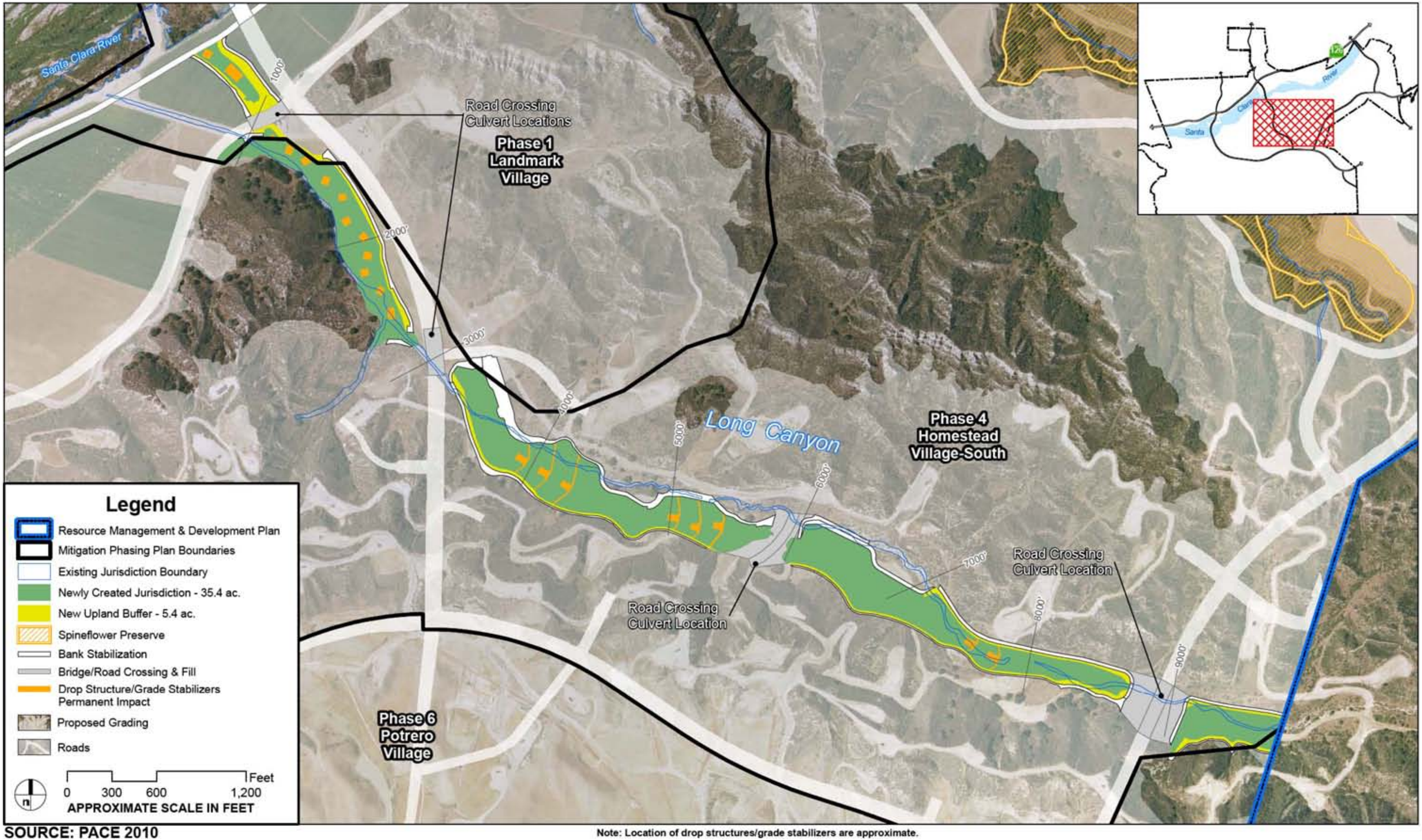

SOURCE: PACE 2010

Note: Location of drop structures/grade stabilizers are approximate.

FIGURE 13

Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch RMDP

Long Canyon Mitigation

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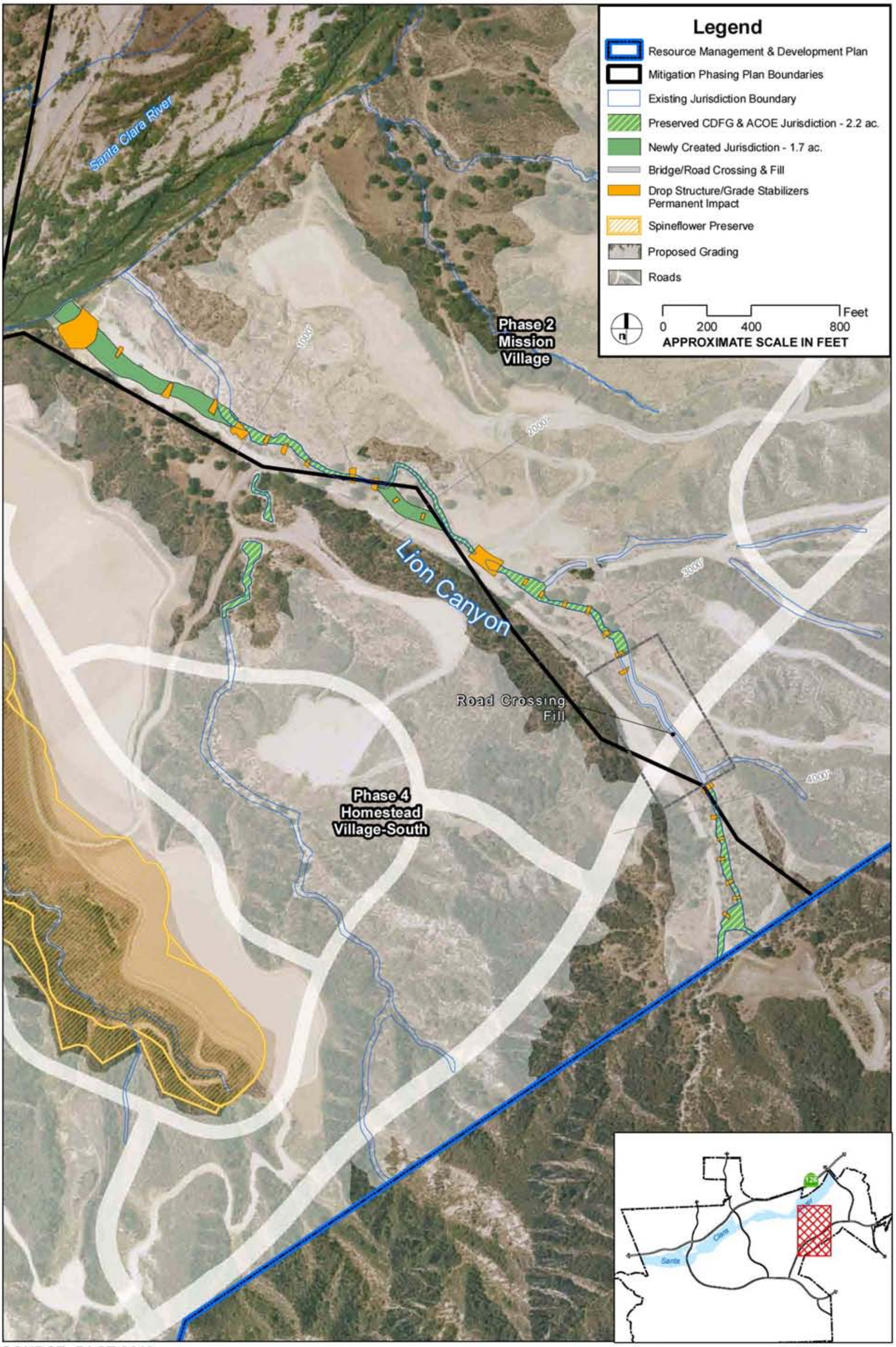

SOURCE: PACE 2010

Note: Location of drop structures/grade stabilizers are approximate.

FIGURE 14

Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch RMDP

LION CANYON MITIGATION

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The temporary and permanent impacts to the tributary canyons within the boundaries of the Mission Village site, including Lion Canyon, Exxon Canyon, Dead-end Canyon, and Middle Canyon, would include filling portions of the canyons to stabilize the upland grading necessary for the development. Additionally, the construction of a 0.05-acre water quality basin in Lion Canyon would require the permanent conversion of big sagebrush scrub that would be mitigated on site.

The proposed Project design includes the placement of three new road crossings in Lion Canyon. These crossings may constrict the floodplain, resulting in an increase in the velocity of flows (*i.e.*, a decrease in channel area would result in an increase in fluid velocity to pass a given flow volume), which would be a significant effect prior to mitigation. The basis of design for this drainage is such that Lion Canyon would be designed to be in geomorphic equilibrium in terms of stability and delivery of sediment and water under future conditions. The channel floodplain would be designed to maximize geomorphic stability and ecological function, provide adequate flood conveyance, and avoid hydromodification to the extent possible. In addition, the design would minimize the need for maintenance activities.

In accordance with mitigation measure SP-4.2-3, hydraulic modeling will be performed for the final design to assess the effects within Lion Canyon, and the design will be modified as necessary to reduce any erosion or deposition impacts. The Lion Canyon channel design incorporates the calculated post-development equilibrium slope to ensure a dynamically stable condition allowing for more or less equal amounts of erosion and deposition. The design will utilize boulder step-pool structures, biotechnical stabilization, soil cement, and turf reinforcement mat to enhance and restore the drainage. The land surrounding the channel would be revegetated with associated riparian plant communities, as well as upland plant communities, to increase the habitat-related functions and values of the drainage channel.

Overall, mitigation in the Mission Village area is expected to create approximately 1.3 acres of jurisdictional area in Lion Canyon as mitigation for impacts at subsequent development phases. Mission Village also includes bank stabilization along the Santa Clara River and the Commerce Center Drive Bridge, which requires 5.4 acres of restoration of jurisdictional area as mitigation for temporary impacts in Phase 2.

2.2.5 Phase 3: Water Reclamation Plant Utility Corridor

The WRP Utility Corridor is a linear east–west corridor paralleling SR-126 and the Santa Clara River. The restoration design concept for this phase of the project is to restore temporary impacts to pre-impact conditions within the San Martinez Grand Canyon drainage channel.

Impacts would occur to drainages originating from the canyons to the north, including Homestead Canyon, Off-Haul Canyon, San Martinez Grande Canyon, and Mid-Martinez Grande Canyon. The drainages emanating from these canyons convey flows into the Santa Clara River. Each of the drainages are ephemeral or intermittent, with occasional patches of native vegetation, including big sagebrush scrub, alluvial scrub, mulefat scrub, arrow weed scrub, and southern willow scrub. Temporary impacts to the drainage channel in San Martinez Grande Canyon would be addressed by recontouring impacted areas to pre-impact conditions. Drainage channels within the other tributaries bisecting the WRP Utility Corridor would be converted to storm drains.

Restoration strategies for temporary impacts would primarily rely upon a passive revegetation approach. If instances of passive restoration are determined by the project biologist to be insufficient to eventually reach performance goals after the first year, then recommendations would be made to approach the restoration in accordance with the methods designed for permanent impacts (*i.e.*, seeding, container plants, and/or a temporary irrigation system may be recommended). Areas temporarily disturbed by construction activities shall also be maintained annually, as needed, for up to 5 years following construction. These areas shall be annually monitored for 5 years after construction in order to document vegetation community establishment.

The WRP Utility Corridor area includes bank stabilization along the Santa Clara River that requires 3.0 acres of restoration of Corps-jurisdictional area as mitigation for temporary impacts in Phase 3.

2.2.6 Phase 4: Homestead Village South

The design approach for mitigation at Homestead Village South is a general treatment of on-site impacts to the Long Canyon tributary drainage that flows through the Homestead Village South project site (Figure 13, Long Canyon Mitigation).

The restoration strategies for the Long Canyon drainage channel within Homestead Village South include (1) complete fill of the stream channel, (2) reconstruction of the stream channel on compacted soil fill, (3) incorporation of stream channel stabilization, and 4) newly created stream channel.

The proposed Project design for Long Canyon would combine soil cement bank stabilization along with a soft-bottom channel. The bank stabilization, consisting of soil cement, would be emplaced according to the requirements established by the County Department of Public Works and Regional Planning (DPW). The basis of design for Long Canyon is such that any increase in flow velocities and shear stress would not exceed the performance specifications of the bank

stabilization. However, the soft bottom of the channel is vulnerable to down-cutting and scour. To decrease the channel velocities, the Project design includes grade stabilizer structures. Proper placement of grade stabilizer structures would allow the channel to reach equilibrium, defined as the condition where the amount of sediment deposited is equivalent to the sediment eroded.

In accordance with the geomorphic basis of design, the final design approach is to preserve the existing channel as a back channel habitat area while creating an additional new channel sized to accommodate the changes in sediment and water delivery due to the build-out of the Newhall Ranch Specific Plan. The recommended approach for designing the reaches where valley grading is proposed involves breaking the valley into alternating long reaches that are at equilibrium grade and short reaches that are much steeper. This approach involves creating reaches of between 100 and 300 feet length where elevation drops of 10 to 30 feet occur (10% gradient). Concentrating the drop in these reaches using sequences of step-pools that convey the capital flood has the advantage of creating a more naturally functioning channel between the drops and of reducing the number and aerial extent of rock structures. The Long Canyon channel design incorporates the calculated post-development equilibrium slope to ensure a dynamically stable condition allowing for more or less equal amounts of erosion and deposition.

The channel will be designed to support a similar complex of native vegetation communities as those that currently occur. Detailed, site-specific mitigation designs will be developed during the design phase, allowing for the creation of a variety of channel features to support diverse vegetation communities to replace impacted functions and values. The restoration approach would rely on the use of a temporary irrigation system and plant materials (seed and container plants) to establish vegetation.

Temporary Corps-jurisdictional impacts would be mitigated through restoration of vegetation communities at the temporary impact site that is equivalent to the impacted vegetation. The intent of restoration of temporary impact areas is to restore the areas to support the same vegetation communities that were there prior to impacts. The critical design feature for achievement of this goal is post-construction recontouring to ensure that the temporary impact areas are restored to pre-impact elevations and contours. Successful recontouring following construction would reestablish the hydrologic connections and/or groundwater relationship that existed prior to construction.

Overall, mitigation in the Homestead Village South area is expected to create approximately 21.1 acres of jurisdictional area in Upper Long Canyon as mitigation for subsequent phases and restore 2.2 acres of jurisdictional area as mitigation for temporary impacts of Phase 4. Depending on the timing of the reconstruction of Long Canyon channel, available mitigation capacity in the

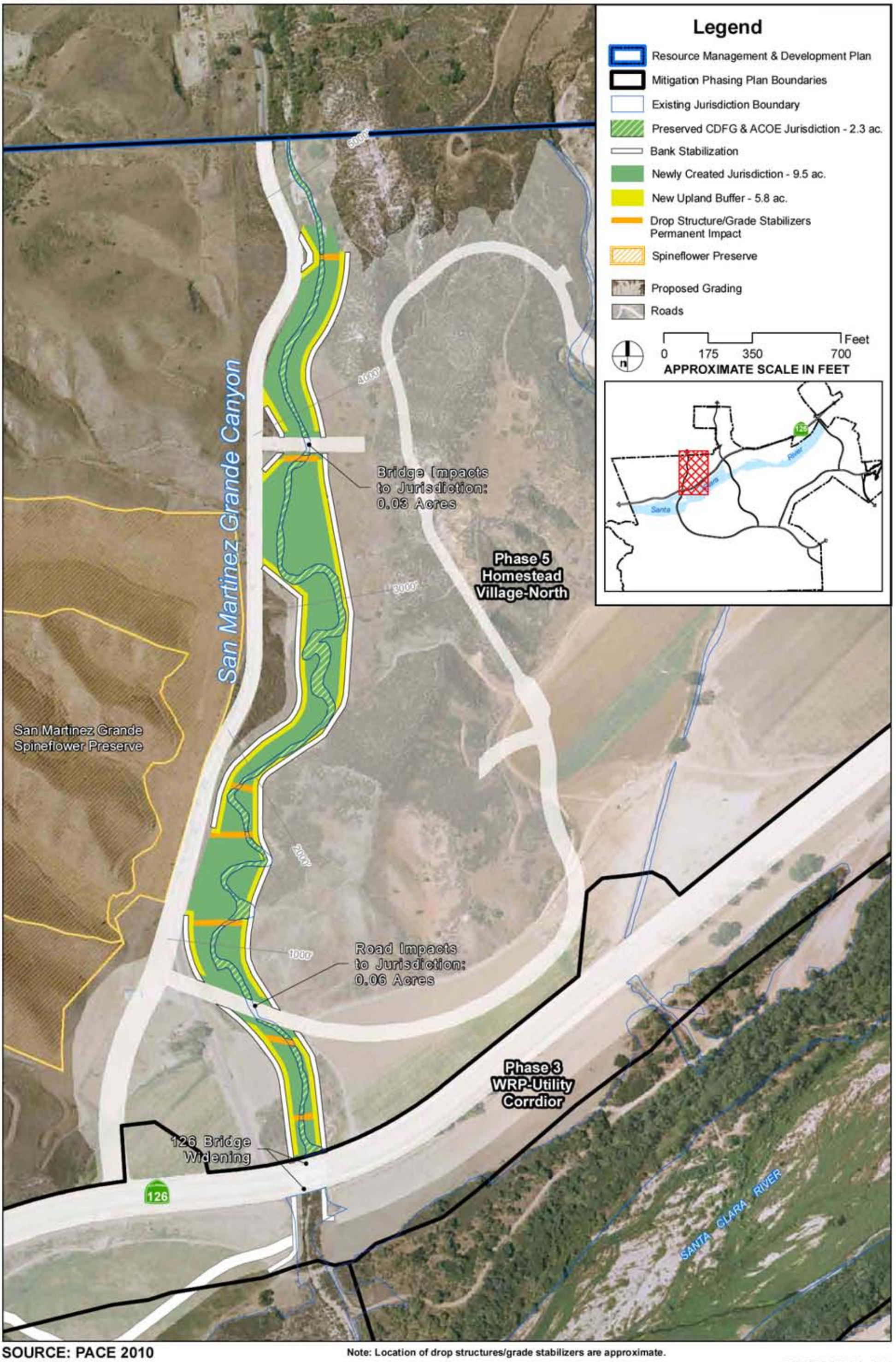
Santa Clara River (implemented as pre-mitigation at Mayo Crossing) may need to be credited toward impacts at Homestead Village South as described above. It is expected that more than 11.3 acres of mitigation capacity would be available in the Mayo Crossing area and, therefore, could offset the 7.8 acres of permanent impacts within Phase 4, if necessary, due to any delay in implementation of the Long Canyon mitigation site.

2.2.7 Phase 5: Homestead Village North

The design approach for mitigation at Homestead Village North is a general treatment of on-site impacts to tributary drainages that flow through the Homestead Village North project site. Tributary drainages that would be impacted and reestablished within the Homestead Village North project area include Chiquito Canyon (northern portions) and San Martinez Grande Canyon (Figure 12, Chiquito Canyon Mitigation and Figure 15, San Martinez Grande Canyon Mitigation). Portions of these drainage channels must be filled to facilitate the proposed design strategy for the development.

The Project would be designed to reduce Project effects to the geomorphic stability (*i.e.*, erosion and deposition) within Chiquito and San Martinez Grande canyons. Specifically, where the channels are not degraded and less extensive development would take place in the watershed, grade control structures would be used to maintain the existing slope. The reengineered channels would be designed to meet the specified basis of design criteria using the following approach:

1. Develop existing condition floodplain and creek hydraulic characteristics using a hydraulic model such as HEC-RAS.
2. Minimize impacts to existing condition floodplain. As a result of reducing the development impacts to the floodplain, the amount of environmental and hydraulic impacts (*e.g.*, substantial erosion or sediment deposition) from the proposed development would be minimized.
3. Creek bank flood protection (*e.g.*, soil cement, rip rap, or other suitable method) would be located to provide for bank erosion protection and flood protection from the DPW Capital design flood event. In most cases, the bank protection would be buried with soil at a 3:1 slope over the hard bank protection. The soil backfill slope would vary from flatter to steeper and may be totally eliminated in some areas where necessary, such as at structures, storm drain outlets, or other pinch points.
4. The tributary canyons would not include a re-grading of the creek invert, although the Erosion Potential of the proposed condition would be validated during the final design phase. For both tributary canyons, the invert stabilization method would be as follows:



SOURCE: PACE 2010

Note: Location of drop structures/grade stabilizers are approximate.

FIGURE 15

Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch RMDP

San Martinez Grande Canyon Mitigation

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a. Creek bed grade control structures at 200- to 400-foot spacing along the creek corridor would be included.

b. These grade control structures would be designed to be located at points along the creek where proposed project grading impacts will already be disturbing the creek bed and banks.

c. The grade control structures would be constructed with soil cement, rip rap, or other grade stabilization methods acceptable to DPW.

d. The grade control structures would be at grade or below the existing grade and invert of the creek bed.

e. The grade control structures would be designed to function as a drop structure in the event the creek bed slope flattens over time.

f. The top and toe elevation would be established based upon DPW standards.

The overall design approach would allow the tributaries to naturally fluctuate between the stabilized existing condition and estimated equilibrium slope while providing suitable erosion and flood protection for public safety. The channel confluences with the Santa Clara River would largely be controlled by the aggradation or degradation in the Santa Clara River, as well as episodic river hydraulic events in the form of backwater effects. The influence of the Santa Clara River on long-term bed stability at the creek channel outlets is expected to exceed that of the Project channel modifications. In both tributaries, the upstream channel inlets (near the beginning of the defined channels) are generally in a natural state, and no improvements would be made in the upstream portions of the channels.

The channels will be designed to support a similar complex of native vegetation communities as those that currently occur. Detailed, site-specific mitigation designs will be developed during the design phase, allowing for the creation of a variety of channel features to support diverse vegetation communities to replace impacted functions and values. The restoration approach would rely on the use of a temporary irrigation system and plant materials (seed and container plants) to establish vegetation.

Temporary Corps-jurisdictional impacts would be mitigated through restoration of vegetation communities at the temporary impact site that is equivalent to the impacted vegetation. The intent of restoration of temporary impact areas is to restore the areas to support the same vegetation communities that were there prior to impacts. The critical design feature for achievement of this goal is post-construction recontouring to ensure that the temporary impact areas are restored to pre-impact elevations and contours. Successful recontouring following

construction would reestablish the hydrologic connections and/or groundwater relationship that existed prior to construction.

The Homestead Village North area is expected to create approximately 14.2 acres of jurisdictional area in Upper Chiquito Canyon and San Martinez Grande Canyon. However, only a portion of this area is expected to be required to offset impacts from subsequent development phases. Phase 5 also includes restoration of 5.2 acres of jurisdictional area as mitigation for temporary impacts.

2.2.8 Phase 6: Potrero Village

Mitigation within Potrero Village includes a combination of restoration of temporary impacts and creation of new jurisdictional areas (Figure 16, Potrero Canyon Mitigation).

The restoration of temporary impacts would include reestablishing the drainage channel in Potrero Canyon after implementation of stabilization measures in the lower reach where the channel bed is unstable in its current configuration. The upper channel is proposed to be filled in a manner similar to Long Canyon and would include (1) complete fill of the stream channel, (2) reconstruction of the stream channel on compacted soil fill, (3) incorporation of stream channel stabilization, and (4) newly created stream channel. A detailed, site-specific mitigation design would be developed during the design phase, allowing for the creation of a variety of channel features to support diverse vegetation communities to replace impacted functions and values. Channel design can recreate a variety of flow gradients that support various vegetation communities. Channel features such as creek terraces can isolate mitigation areas where net evaporation is needed to support hypersaline conditions. The control of soil substrate would allow for the installation of low permeable layers that perch groundwater to create localized wetland areas. Soil salvage may be used when on-site soils are unique and conducive to the establishment of specific vegetation types.

SOURCE: PACE 2010

Note: Location of drop structures/grade stabilizers are approximate.

FIGURE 16

Mitigation and Monitoring Plan For Impacts to Waters of the United States for the Newhall Ranch RMDP

Potrero Canyon Mitigation

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The creation of new Corps-jurisdictional areas at Potrero Village would include establishing new areas of cismontane alkali marsh (CAM) to compensate for impacts to this vegetation community that would occur along the drainage in Potrero Canyon. CAM vegetation is planned to be restored downstream of the project fill area on an approximately 19-acre agricultural field and pastureland that may necessitate some micro-topographical grading. It is likely, due to numerous site conditions observed, that this field may be successfully converted into a CAM habitat area. Prior to intensive agricultural activities, this field likely supported CAM. This conclusion is based on the following observed site characteristics:

- Site soils present similar textural and chemical characteristics as found in areas currently supporting CAM vegetation. These factors include fine-textured silty soils and hypersalinity. Hypersalinity at the CAM mitigation site is a key component of CAM ecology that excludes other freshwater and brackish marsh species from establishing within CAM-occupied sites.
- Subsurface hydrology appears to be similar to areas supporting CAM vegetation. Groundwater depth and movement is similar to CAM-occupied sites within Potrero Canyon. In existing CAM areas, groundwater depth was measured from December 2006 through December 2007. Groundwater depth ranged from 1.99 to a maximum of 7.13 feet below land surface during this period. Within the planned CAM mitigation site, groundwater was measured at a maximum depth of 7.9 feet below land surface.
- CAM is present immediately downstream of the planned CAM mitigation site in a shallow drainage swale that is hydraulically connected to the planned CAM mitigation site. This proximity suggests a shared hydrology and soils that would support CAM vegetation.
- The planned CAM mitigation site will retain a significant watershed area that provides overland sheet flow across the site during winter rain events. The low intensity–low volume, prolonged-duration sheet flow is characteristic of CAM sites throughout the valley. It is not known what contribution this surface hydrology makes to sustain CAM vegetation, but the similar characteristic of the mitigation site will mimic existing CAM-occupied sites. Sheet flow is expected to provide winter soil saturation at the ground surface and slowly dry through spring months. This dry down period likely protects CAM sites from leaching salinity from the soil while providing needed soil saturation that maintains CAM vegetation.

Beyond the similar site characteristics shared between the existing and planned CAM sites, the mitigation approach to be implemented is designed to support successful establishment of self-

sustaining CAM vegetation and ecological functions and services. The following features of the mitigation approach are designed to support mitigation success:

- The existing unpaved road and culvert drainage structure that is present at the downstream edge of the mitigation site will be topographically modified to augment down-canyon sheet flow from the mitigation site to the existing CAM vegetation. Similarly, the unpaved road south of the planned mitigation site will be modified to augment surface hydrology connects to the upland watershed south of the mitigation area. These land alterations are intended to create appropriate sheet flow, soil saturation, and local groundwater replenishment during winter months. The restored hydraulic system will promote the desired annual soil wetting/dry-down cycle that sustains hypersaline soils that support CAM vegetation in Potrero Canyon.
- CAM soil salvage will be implemented where topographic modifications are required to reestablish surface hydrology and the hydraulic connection between upland watershed areas and adjacent CAM vegetation areas downstream of the mitigation site. This technique will be used to restore localized surface hydrology of the Potrero Valley bottom land that supports CAM vegetation.
- CAM vegetation will be salvaged as blocks and as smaller plugs for transplantation from the impacted CAM sites to the mitigation site to reestablish CAM vegetation throughout the mitigation site. Use of the existing CAM that would be impacted will maintain genetic diversity and the species composition of CAM vegetation in Potrero Canyon and increase the ability of CAM vegetation to establish self-sustaining vegetation coverage across the mitigation site within the 5-year maintenance and monitoring period.
- Seed collection from CAM species throughout Potrero Canyon will be conducted for multiple seasons prior to CAM impacts to build a substantial supply of local genetic native seed that will be used to establish CAM vegetation at the planned mitigation site. Seed supplies will be held in storage to provide a ready supply of seed should remedial actions be required to supplement underperforming areas of the mitigation site during the CAM vegetation establishment period.
- Appropriate vegetation performance criteria will be established through measurement of CAM reference sites prior to project impacts. These criteria will be used to inform mitigation site evaluations during the CAM establishment period and will drive adaptive management and remedial actions to maintain the vegetation establishment trajectory toward achievement of ultimate performance criteria.

- A mitigation monitoring program will be developed to support collection of appropriate botanical, vegetation, and hydrology data that directly relate to mitigation performance criteria. Monitoring data and observations will provide essential feedback for effective adaptive management decisions to be made and implemented during the vegetation establishment period.
- A mitigation maintenance program will be designed to support vegetation establishment and implement adaptive management decisions during the vegetation establishment period. Maintenance will be focused on non-native vegetation management to promote native vegetation recruitment and establishment of an *in situ* native seed bank that fosters native recruitment, vegetation community resilience, and ultimately promotes sustainable CAM vegetation communities. Remedial actions will be implemented under the maintenance program to correct site deficiencies and promote successful attainment of mitigation goals.

The reconstruction and stabilization of the drainage in Potrero Village area is expected to create approximately 70.0 acres of jurisdictional area, although under the phasing plan described herein, this mitigation is not needed as credit for Phase 6 or for any subsequent development phases. Additionally, approximately 6.3 acres of Corps-jurisdictional area would be restored as mitigation for temporary impacts of Phase 6. In addition, the 19-acre cismontane alkaline marsh restoration site identified in lower Potrero Canyon is available to offset impacts to special aquatic sites within Reach PO-4 of the Potrero Drainage (middle CAM area). This mitigation area would be in addition to any remaining wetland credits from mitigation areas created within the Santa Clara River at the Mayo Crossing site.

2.3 Time Lapse between Jurisdictional Impacts and Expected Compensatory Mitigation Success

The mitigation design concept is organized into six development phases with jurisdictional waters of the United States impacts based on the anticipated implementation schedule and geographic location as depicted on Figure 9a. Anticipated time frames for phased development implementation are included in Table 7.

Table 7
Mitigation Design Concept Phases and Time Frames

Phase	Location	Anticipated Time Frame*
1	Landmark Village	3 to 5 years
2	Mission Village	3 to 5 years
3	WRP Utility Corridor	3 to 5 years
4	Homestead Village South	5 to 10 years
5	Homestead Village North	5 to 10 years
6	Potrero Village	10 to 15 years

* Time frame measured from date of 404 permit issuance.

This mitigation program is designed to minimize temporal loss associated with development impacts through pre-mitigation or concurrent mitigation projects. The mitigation strategy to reduce or eliminate temporal loss involves staggered mitigation projects that are timed with development phases as shown in Table 7. For example, the impacts resulting from implementation of the Landmark Village project are planned to be mitigated through two pre-mitigation projects at the Mayo Crossing and Salt Creek wetlands mitigation sites. Excess mitigation credits at the pre-mitigation sites not used as credit for impacts that occur at the Landmark Village project will be used as compensatory mitigation for the subsequent phase (*i.e.*, Mission Village). Concurrent with Landmark Village construction, wetlands creation will be constructed on the Santa Clara River and in lower Chiquito Canyon. These mitigation areas will be used to supplement on-site compensatory mitigation efforts for subsequent development phases such as the WRP Utility Corridor and Homestead Village. Similarly, the Homestead Village development phase will implement on-site mitigation in Upper Chiquito Canyon.

2.4 Special Aquatic Habitats, Other Waters of the United States, and Non-Jurisdictional Areas Proposed as Compensatory Mitigation

The areas of the tributary canyons that are designated for the establishment of Corps-jurisdictional areas will be designed to be located within a riparian corridor that will also include vegetation communities established as mitigation for impacts to CDFG jurisdictional resources. The established CDFG jurisdictional areas will provide a native buffer around the Corps-jurisdictional creation areas. While no specific acreage mitigation credit has been allocated for the establishment of these native buffers, it is anticipated that the presence of the native buffers will improve the functions and services of the newly established Corps areas. The functions and services that will be provided by the establishment of native buffers include greater average

buffer width, improved buffer condition, improved floodplain connection, improved flood-prone area, and greater interspersion and zonation.

2.5 Overall Watershed Improvements to be Gained

The planned mitigation projects will be designed to provide overall watershed improvements. Such improvements include:

- A reduction of tributary channel incisement with the incorporation of engineered drop structures and flood flow attenuation materials.
- An improved tributary hydrologic regime that promotes increased surface water persistence and groundwater recharge.
- Improved riparian corridor connectivity between the river and tributary drainages through the comprehensive tributary mitigation designs.
- Improved floodplain connectivity through the establishment of riparian buffers and the stabilization of eroded and incised channel banks.
- Increased interspersion and zonation with the establishment of a greater variety of plant zones due to the incorporation of engineered drop structures and flood flow attenuation materials in the tributary canyons.
- Reduced exotic vegetation through long-term management. Control of exotic vegetation within the mitigation areas will not only improve the functions and values of the on-site mitigation areas but also of habitat areas downstream of the project areas by minimizing the release of weed propagules downstream.
- Greater topographic complexity and biochemical processes through design engineering of channel gradients and flood-prone buffers.

3.0 DESCRIPTION OF THE PLANNED COMPENSATORY MITIGATION SITES

3.1 Process of Selecting Mitigation Sites

Mitigation within tributary drainages (with the exception of Salt Creek) was designed into each development phase to minimize permanent impacts and maintain the geographic distribution of wetlands within the major tributary canyons and along the Santa Clara River. The selection of the major tributary drainages was also based on development design considerations. The design of these wetland drainages takes into account the existing hydrologic regime in each canyon.

Mitigation areas were selected through a comprehensive evaluation process described in detail in the Revised Draft Newhall Ranch Mitigation Feasibility Report (Dudek 2007b). To maintain consistency with the *Hybrid Functional Assessment of Wetland and Riparian Habitats for the Newhall Ranch Habitat Management Plan* (HFA; URS 2004; revised and now referred to as HARC), Dudek divided the stream channels within the study area into reaches, as in the HFA, for discussing wetlands mitigation potential. A total of 57 reaches were evaluated within the study area, with 46 occurring within proposed open space and preserve areas. Stream reaches within the tributary canyons (with the exception of Salt Creek) were evaluated separately from this study.

Dudek considered three types of wetlands restoration potential: wetlands enhancement, stream bank stabilization, and wetlands creation. For wetlands enhancement, the percent cover of non-native, invasive plants was estimated in wetland vegetation communities in potential wetlands enhancement areas within the study area. For the Santa Clara River, there are substantial wetlands enhancement opportunities in various wetland vegetation communities. However, due to the extensive effort required to estimate and map invasive plant cover percentages, and the high potential for this to change between the present conditions and future implementation, specific enhancement opportunities were not evaluated in the Santa Clara River and associated wetlands vegetation communities, but could be assessed during the preparation of site-specific mitigation plans.

For wetlands creation, Dudek evaluated the suitability of potential mitigation opportunities in the study area based on several factors pertinent to determining suitability of wetlands mitigation projects, including hydrology, soil conditions, existing vegetation, habitat connectivity, stream bank stability, construction/maintenance access, grading requirements, planting and irrigation requirements, mitigation credit, and long-term management considerations. The criteria were prioritized based on their suitability for potential wetlands creation mitigation and are described in more detail below.

Hydrology

Hydrology is the most critical factor in determining potential suitability for wetlands creation. Hydrology along each of the reaches in the study area was evaluated based on a number of factors, including the location in the watershed, presence and/or persistence of surface water, source of water, and amount of surface water. Potential sites with the presence and/or persistence of surface water, a natural water source, and a higher amount of surface water were considered to have greater restoration potential and were therefore ranked higher in this analysis. The HFA classified each of the reaches as ephemeral, ephemeral/intermittent, riverine persistent, or

perennial. The HFA classifications for each stream reach were taken into consideration when evaluating and ranking hydrology.

Soil Conditions

Soil conditions were evaluated based on the type of soils present, which relates to erosive potential and water holding capacity, presence of organic matter, and soil disturbance. In general, soil types throughout the study area were of the same general type, Balcom-Castaic-Saugus association, which is a combination of silty clay loam and loam. The soils are derived from weakly consolidated sediments, soft sandstone, and soft shale and are generally highly erosive and well drained. In the upper reaches (higher elevations), there seemed to be a greater composition of rock in the soil; however, the soil remained unconsolidated and highly erosive.

Other soil types present in more limited areas include Chino loam, which occurs on nearly level land. It is a deep soil with a seasonally high water table present within 3 to 4 feet from the surface. This soil type is suitable for wetland mitigation. Sandy alluvial land, Cortina sandy loam, Hanford sandy loam, Sorrento loam, and Yolo loam are soils found along the Santa Clara River and its tributaries and are generally suitable for wetland mitigation. Castaic and Saugus soils are other soil types found in potential mitigation areas that are severely eroded and highly erosive.

In this analysis, soils with lower erosion potential, greater water holding capacity, higher presence of organic matter, and less soil disturbance were considered to have greater suitability for wetlands creation/restoration. However, nearly all soils within the study area appeared to have high erosion potential and high soil disturbance.

Existing Vegetation

The existing vegetation was evaluated based on the vegetation communities present; age and structural heterogeneity, including canopy development; presence of non-native, invasive plants; and riparian corridor connectivity. Potential mitigation sites adjacent to stream channels with intact native wetland vegetation, diverse age and structural heterogeneity, a well-developed tree canopy, lack of non-native invasive plants, and the presence of a riparian corridor were ranked higher in this analysis based on the rationale that if these conditions are present, then there are potentially adequate conditions to create additional wetlands habitat.

Habitat Connectivity

For potential wetlands enhancement areas, this criterion was evaluated based on connectivity of riparian habitat to adjacent transitional upland habitats. For potential wetlands creation areas and stream bank stabilization areas, this criterion was evaluated based on connectivity of the restored wetlands habitat after the hypothetical installation of the wetlands mitigation areas. The level of disturbance of the transitional uplands habitat was the primary consideration. Potential sites with degraded vegetated buffers dominated by non-native vegetation are more vulnerable to erosion and more likely to contribute weed seed to potential wetlands mitigation sites. Therefore, sites with native vegetated buffers were ranked higher than those with degraded, non-native buffers. An additional consideration was connectivity to permanent unnatural features such as roadways or developed areas. Adjacency to these types of areas was ranked moderate based on the fact that roadways or developed areas are less likely to be vulnerable to erosion but, depending on how edge areas are planted/maintained, can be more or less likely to contribute weed seed to potential wetlands mitigation sites.

Stream Bank Stability

A general assessment of channel morphology was conducted to identify areas with the highest stream bank stability. Features that provide insight into this issue include the presence of cut banks, slip faces, underfit/overfit stream courses, degree of braided flow, and bed grain size. The stability of the stream banks along each of the reaches was evaluated based on the development of flood plain terraces, angle of the bank cuts, and stability of the bank soils. Areas with stream banks that have multiple terraces, gentle angles on the bank cuts, and more stable bank soils were considered more suitable, and ranked higher, than those without terraces, steep bank cuts, and instable bank soils.

Construction/Maintenance Access

Each of the reaches was evaluated based on construction and/or maintenance access to potential wetlands mitigation sites. The presence of roads that are suitable for grading equipment was a key factor in the identification of wetland creation sites. Sites that are adjacent to existing roads or those that could be easily accessed from existing roads were considered more suitable potential wetlands creation/restoration sites than sites that are inaccessible to vehicles.

Grading Requirements

The amount of grading required to construct potential wetlands creation/restoration sites was evaluated. Potential sites where minimal grading would be needed to achieve creation/restoration

goals were considered more suitable sites and were therefore ranked higher than potential sites that would require extensive grading. No detailed calculations were made to determine actual volume of material that would have to be removed to restore or create wetlands vegetation communities. Estimations of grading requirements were generally based on the depth of cut required and the surface area to be graded.

Irrigation Availability

Irrigation availability was evaluated along each reach. Potential wetlands creation/restoration sites with access to a potential irrigation source were ranked higher than those without.

Mitigation Credit

The amount of acreage available for wetlands mitigation credit was evaluated at each potential site. Areas where greater wetlands mitigation acreage could be achieved were ranked higher than sites that would result in minimal wetlands mitigation acreage. In general for this factor, sites less than 1 acre were ranked low, sites between 1 and 5 acres were ranked moderate, and sites greater than 5 acres were ranked high.

Long-Term Management Considerations

Long-term management considerations include evaluating the potential for issues that could create long-term management problems in the future after the installation of wetlands mitigation. Factors were evaluated for each potential wetlands creation/restoration site and included the degree to which a site would be self-sustaining in the long term, potential for reinvasion of non-native invasive plant species, future access constraints, and potential to be subject to damage from flooding or to contribute to flooding in unwanted areas. Sites that would be self-sustaining, have minimal potential for reinvasion of invasive non-native plant species, provide uninhibited long-term access, and be less prone to damage from flooding or contribute flooding in unwanted areas were considered to have greater suitability in terms of minimizing long-term management problems and were therefore ranked higher in this analysis.

Based on site investigations and considering the above factors, it was determined that the mitigation opportunities along the margins of the Santa Clara River, including Mayo Crossing, and Salt Creek provided the best opportunities for wetlands creation outside of the development phases.

3.2 Location of Compensatory Mitigation Sites

Temporary and permanent wetlands impacts will be mitigated as described in the mitigation phases above. Permanent impacts will be mitigated at the Mayo Crossing and Salt Creek sites, and within the larger tributary drainages. The locational information of each of the planned mitigation sites is summarized in Table 8.

Table 8
Mitigation Site Location

Mitigation Locations	Latitude	Longitude	USGS 7.5-Minute Map	Township	Range	Section
Phase 1- Landmark Village (Santa Clara River, Lower Chiquito Canyon, and Lower Long Canyon)	'118° 38' 9"	'34° 25' 22"	Val Verde	T4N	R17W	23
Phase 2 – Mission Village (Lion Canyon)	'118° 37' 9"	'34° 25' 13"	Newhall	T4N	R17W	24
Phase 3 – WRP Utility Corridor (Santa Clara River)	'118° 40' 26"	'34° 24' 34"	Val Verde	T4N	R17W	28
Phase 4 – Homestead Village South (Long Canyon)	'118° 39' 13"	'34° 25' 34"	Val Verde	T4N	R17W	22
Phase 5 – Homestead Village North (San Martinez Grande and Upper Chiquito Canyons)	'118° 37' 47"	'34° 24' 28"	Newhall	T4N	R17W	26
Phase 6 – Potrero Village	'118° 38' 25"	'34° 23' 46"	Val Verde	T4N	R17W	27
Pre-Mitigation Areas						
Mayo Crossing	'118° 40' 22"	'34° 24' 25"	Val Verde	T4N	R17W	28
Salt Creek	'118° 41' 49"	'34° 23' 58"	Val Verde	T4N	R17W	32

3.3 Ownership Status

All land within the RMDP area is owned in fee title by Newhall Land. Land ownership includes all water rights associated with each parcel.

3.4 Existing Functions and Values of Compensatory Mitigation Sites

The existing functions and values of compensatory mitigation sites vary but generally include two sets of conditions. One set of conditions pertains to the tributary drainages that will be graded and reconfigured as a component of the development project in order to accommodate construction techniques that are necessary to stabilize the development area. These tributary drainages currently provide typical functions and values commensurate with moderately to

severely disturbed intermittent and ephemeral drainages in the region, as described in **Section 1.5**. However, due to the proposed design to reconfigure the tributary drainage channels, the existing functions and values will be temporarily lost and then replaced with the implementation of the planned mitigation.

The other set of conditions present at planned mitigation sites pertains to the mitigation areas that are planned along the Santa Clara River (including Mayo Crossing) and Salt Creek. In these instances, the existing functions and values of the planned mitigation areas are typically very low because the current land use is agriculture (Santa Clara River and lower portions of Salt Creek) or grazing (Salt Creek). Under these land uses, the land is repeatedly disturbed and therefore does not support native vegetation communities and associated functions and values.

3.5 Present and Proposed Uses of the Compensatory Mitigation Sites and All Adjacent Areas

Past and current land uses at each of the mitigation sites differ. Mitigation sites within the phased development areas are described below:

Phase 1 Landmark Village

The Landmark Village development area encompasses mitigation areas along the Santa Clara River, lower Chiquito Canyon, and lower Long Canyon. At present, the planned wetlands creation mitigation area adjacent to the Santa Clara River is under active agriculture. Lower Chiquito Canyon and Long Canyon are in a combination of open space where the existing creek is located and adjacent active agriculture. The lower 2,000 feet of the Long Canyon drainage channel has been channelized across active agricultural fields before reaching the Santa Clara River floodway. Once implemented, these mitigation areas are planned as conserved open space as part of the RMDP.

Phase 2 Mission Village

The Mission Village development area encompasses mitigation planned in Lion Canyon. Current land uses in this canyon include a combination of open space, grazing, and oil and gas extraction activities. Ranching and energy facilities within the canyon include access roads, creek crossings, and well pads. Once implemented, this mitigation area is planned as conserved open space as part of the RMDP.

Phase 3 WRP Utility Corridor

The WRP Utility Corridor does not encompass planned mitigation areas.

Phase 4 Homestead Village South

The Homestead Village South development area encompasses mitigation planned in Long Canyon. Current land uses in this canyon includes a combination of open space, grazing, agriculture, and oil and gas extraction activities. Ranching and energy facilities within the canyon include access roads, creek crossings, and well pads. Once implemented, the mitigation areas within this canyon are planned as conserved open space as part of the RMDP.

Phase 5 Homestead Village North

The Homestead Village North development area encompasses mitigation planned in San Martinez Grande Canyon and Chiquito Canyon. Current land uses in these canyons include a combination of open space, grazing, agriculture, and oil and gas extraction activities. Ranching and energy facilities within the canyons include access roads, creek crossings, and well pads. Once implemented, these mitigation areas are planned as conserved open space as part of the RMDP.

Phase 6 Potrero Village

The Potrero Village development area encompasses mitigation planned in Potrero Canyon. Current land uses in this canyon includes a combination of grazing, agriculture, and oil and gas extraction activities. Ranching and energy facilities within the canyon includes access roads, creek crossings, well pads, oil pipelines, ranch houses, and barns. Once implemented, the mitigation areas within Potrero Village are planned as conserved open space as part of the RMDP.

Pre-Mitigation Areas

In addition to mitigation within the boundaries of the development phases, mitigation sites will also occur within the Salt Creek area and at Mayo Crossing within the Santa Clara River. Current land uses at the planned mitigation areas within the Salt Creek area include agricultural land (particularly in the lower reaches) and ranching and farming facilities such as access roads and creek crossings. The planned Mayo Crossing mitigation area is an active, intensive agricultural area that occurs within the Santa Clara River corridor. Once implemented, the mitigation areas

within Salt Creek and at Mayo Crossing are planned as conserved open space as part of the RMDP.

4.0 IMPLEMENTATION PLAN FOR THE COMPENSATORY MITIGATION SITE

Implementation of the mitigation design requires a series of coordinated, progressive steps to properly install the planned mitigation projects. Many of these steps are prerequisites for subsequent activities to occur. This section describes the steps that are necessary to implement this mitigation plan.

4.1 Rationale for Expecting Project Success

The rationale for expecting project success includes the implementation of restoration designs that consider and incorporate appropriate conditions for the establishment and sustainment of the target vegetation communities. Grading and contouring designs and their successful implementation will be integral to project success to ensure that elevations are established that will allow dynamic interaction with subsurface low flows, the water table, and periodic seasonal flooding.

To support the success of the restoration designs, the individual mitigation projects will be planted with species that are successfully growing in adjacent native areas and within the watershed. Vegetation communities will be appropriately located in accordance with their respective water needs, with less hydric vegetation communities being located in transitional upland locations and more hydric vegetation communities being located closer to anticipated surface and subsurface flows or groundwater. Further, the sites will be maintained for a period of 5 years to control non-native species. Site-specific restoration tools will also be utilized as appropriate, including temporary irrigation systems, rock gabions, berms, riprap, or other features designed to retain, entrain, or convey surface water flows.

In instances where channel reconstruction is planned within the tributary drainages, vegetation communities associated with these drainages will be successfully mitigated through establishment of comparable vegetation communities within the reconstructed channels that will run through the development project. The channel and mitigation design support the conclusion that all representative vegetation communities present and replacement ecological functions and services can be successfully established in the project context. The following factors support this conclusion:

- The reconstructed channels will tie in to existing hydraulic inputs at the edge of development, essentially extending the existing hydraulic regime of the drainage channels into the newly re-constructed channels. Therefore, the runoff hydrograph of storm events will remain similar in intensity and duration as presently observed and recorded in the existing drainages, and the hydrology of the constructed channels will provide similar scour and deposition functions as the impacted channel. This hydrology function is key to establishing self-sustaining vegetation communities, such as mulefat scrub, southern willow scrub, southern cottonwood–willow riparian forest, and unvegetated streambed.
- In instances where soil characteristics may be critical to the resulting habitat supported by the reconstructed channel (*e.g.*, Potrero Canyon), soil salvage and replacement may be implemented. Soil salvage will be implemented in these instances to provide comparable grain size distribution within the constructed channel bottom. Soil salvage and replacement will be used to create a similar soil profile as found in the impacted stream course. This profile will have similar percolation and water retention characteristics as the impacted channel. The soil profile restoration is an essential factor in differentiating native communities along the stream course, and this physical characteristic will be recreated in the constructed channel.
- The constructed channel designs incorporate several grade structures that provide multiple services to the associated vegetation communities. Channel structures will create subsurface hydrology variability that will effectively create moisture gradients that support the desired range of native vegetation communities. Subsurface moisture retention is anticipated to be greatest immediately upstream of these structures. The resultant mesic pockets at these locations will support southern cottonwood–willow riparian forest and southern willow scrub vegetation communities. Drier soil conditions and retreating groundwater resources upstream of the structures will favor mulefat scrub and other ephemeral drainage vegetation communities that are capable of persisting without reliable subsurface water. The most xeric conditions are anticipated to occur between grade structures. Coarse bed materials placed at these locations will create non-vegetated waters of the United States. These areas serve as groundwater percolation sites that replenish local groundwater. The high percolation rates associated with these areas will maintain the channel in a non-vegetated state that is typical of many channel reaches in Potrero Canyon.
- A variable channel width will be used to create areas of scour and deposition that are characteristic of the existing canyon. Scour and deposition are important functions that specific vegetation communities rely upon to persist in a particular location.

Providing a variety of scour and deposition features will support diverse vegetation communities.

- A layer of semi-permeable material, such as clay, may be used to enhance subsurface water storage and resources for riparian vegetation where southern cottonwood–willow riparian forest and southern willow scrub are planned. This technique is used to perch water resources within the root zone of wetland species.
- Use of local plant materials will maintain the genetic integrity of the mitigation site and the species diversity found within Potrero Canyon.

4.2 Responsible Parties

The responsible parties identified in **Section 1.1** also apply to this section.

4.3 Financial Assurances

Implementation of the mitigation and 5-year maintenance and monitoring programs according to the specifications described herein will be funded through performance bonds or other approved financial assurance mechanism (security may be a pledged savings or trust account, certificate of deposit, irrevocable letter of credit, surety bond, or other form approved by CDFG, but shall hereafter simply be referred to as "bond"). A bond will be issued for Year 1 mitigation activities; the bond is anticipated to cover capital costs associated with mitigation land infrastructure (*i.e.*, permanent fencing and signage) and mitigation land legal protection (*i.e.*, legal descriptions and conservation easement recordation). Additional bonds will be issued as each village or individual project is implemented and shall include mitigation implementation costs associated with mitigation final design, construction, planting, irrigation and maintenance, and performance monitoring and reporting.

Financial assurances will be provided in accordance with the multiple species take permit allowed under Fish and Game Code Section 2081 by California Department of Fish and Game, co-lead agency on the Newhall Ranch RMDP EIS/EIR document and state agency with regulatory authority over the same resources as the Corps. Cost estimates for the financial assurance would be provided to the Corps for review with the construction notification package; however, the bond would be held by CDFG.

In the case of the conservation easement over mitigation areas, Newhall Land owns the subject land; thus, it does not require subsequent funding for property purchase. The amount of security posted for each construction notification shall be based on the estimated cost of carrying out the mitigation measures and monitoring activities for that project. Nothing shall prevent the

applicant from requesting and obtaining partial or final release of any established security upon demonstrating to the Corps and CDFG that mitigation, monitoring, and reporting obligations have been satisfied for a project, or portion thereof. Updated security cost estimates and a replacement security may be submitted as necessary to carry out those activities yet to be fully satisfied. The Annual Mitigation Monitoring Report submittal shall be used for such requests.

CDFG will be responsible for the administration of the bond; however, the Corps has shared responsibility for review and approval of the amounts. It is anticipated that within 30 days of receiving a security proposal, a replacement instrument, or a request for partial or full release of an individual project security, the Corps shall, in writing: (1) review the cost estimates and adjust those estimates as needed to reflect the probable costs of carrying out, or completing, the required mitigation and monitoring measures; (2) review the request for partial or final security release; and (3) approve or deny the request for security replacement or release. Any denial of a security shall be in writing, with a reason for the decision.

4.4 Implementation Schedule

Project implementation will vary by site and phase. In general, mitigation project installation should be timed to occur in the late fall/early winter prior to the onset of the rainy season. In some cases where extreme flood volumes and velocities are expected, such as in the Santa Clara River, installation should occur in late spring or early summer to allow for a period of plant establishment before the onset of the fall rainy season. Individual project timelines will vary depending on a variety of factors related to construction. A general sequential ordering of implementation tasks is shown below (as applicable to each individual project):

- Plant propagule collection and container plant propagation
- Initiate enhancement component of project, if applicable
- Salvage native plant materials for mulch
- Salvage topsoil from existing wetlands or non-wetland waters of the United States areas
- Salvage tree trunks over 12 inches in diameter at breast height for wildlife habitat and stabilization structures
- Finish grading and contouring restoration areas to be compatible with adjacent native vegetation and streambed
- Apply salvaged topsoil and test for fertility
- Install irrigation system

- Conduct "grow and kill" cycles at the discretion of the project biologist
- Install salvaged native vegetation mulch in temporary impact areas, if available
- Install container stock throughout all mitigation and buffer areas
- Apply seed mixes in all mitigation areas
- Begin 120-day plant establishment maintenance and monitoring period
- Begin 5-year maintenance and monitoring period.

4.5 Site Preparation

The following mitigation project elements will be considered and implemented, as appropriate, on each of the mitigation sites. The degree of application of these elements will be determined and defined in the site-specific mitigation plans that will be included in each construction notification package.

4.5.1 Special-Status Species Avoidance and Pre-Construction Wildlife Surveys

Prior to mitigation site clearing or vegetation removal, special-status species surveys may be necessary, depending on their potential to be present and previous survey efforts. These special-status species may include arroyo toad, California red-legged frog, American badger, unarmored threespine stickleback, arroyo chub, Santa Ana sucker, southwestern pond turtle, western spadefoot toad, coast horned lizard, silvery legless lizard, coastal western whiptail, rosy boa, San Bernardino ringneck snake, coast patch-nosed snake, burrowing owl, San Diego black-tailed jackrabbit, San Diego desert woodrat, mountain lion natal dens, active roosts of special-status bats, San Emigdio blue butterfly, ringtail, *Pyrgulopsis castaicensis* n. sp., trask shoulderband snail, two-striped garter snake, south coast garter snake, and nesting birds. If necessary, special-status species surveys will occur in accordance with Newhall Ranch Specific Plan Program EIR (County of Los Angeles 2003) mitigation measures SP 4.6-53, SP 4.6-54, and SP 4.6-59; Final EIS/EIR mitigation measures BIO-17, BIO-18, BIO-41, BIO-43, BIO-46, BIO-50, BIO-53, BIO-54, BIO-56, BIO-57, BIO-58, BIO-60, BIO-61, BIO-65, BIO-83, BIO-86, and BIO-89; and project-specific mitigation measures.

4.5.2 Boundary Fencing

Prior to beginning mitigation site preparation work and vegetation restoration efforts, the limit of work shall be confirmed and delineated with protective high-visibility orange construction fencing, if not already in place from site-development construction.

Protective fencing shall be installed in all areas adjacent to native vegetation and/or wetland areas. Protective fencing shall be maintained for the duration of construction activities to maximize habitat protection. Protective fencing shall be removed upon completion of construction and vegetation restoration work, as directed by the project biologist.

4.5.3 Erosion Control—Best Management Practices

Erosion prevention and sediment control measures shall be implemented as indicated and in accordance with the adopted project grading/erosion-control plans, associated grading and resource agency permits, and Stormwater Pollution Prevention Program (SWPPP). Erosion prevention and sediment control devices will be implemented and maintained as necessary to prevent erosion and to prevent deposition of sediment off site, including into adjacent riparian areas. The project biologist will monitor best management practices (BMPs) during mitigation construction and grading and will provide periodic monitoring reports to Newhall Land.

The dynamic and volatile seasonal flow patterns of the Santa Clara River and some of its tributaries are responsible for the highly variable storm flow events in the project area. Storm flow could result in the loss of project fencing and may affect BMPs. Project fencing and BMPs lost/affected due to storm flow events will be replaced or modified, or additional erosion control devices shall be installed at the discretion of the project biologist.

4.5.4 Vegetation Mulching

It is anticipated that native mulch will be applied to the temporary impact areas to encourage natural recruitment. The source of that native mulch will either be from on site or from Newhall Land's nearby mulching facility. If mulch from on site is used, it will be made from native vegetation removed during vegetation clearing. If the on-site mulch must be stored for an extended period of time (greater than approximately 1 month), fresh native mulch from Newhall Land's mulching facility will be acquired and applied to the temporary impact areas following construction. Fresh native mulch created just before mitigation implementation will improve viability of seeds and propagules, as infertility of propagules will increase over time. Ideally, mulch will be no more than 1 week to 1 month old depending on the season. The mulch from a nearby project should be created from the same vegetation types with similar species composition. A portion of native topsoil salvaged from the impact areas (**Section 5.6**) will be mixed with mulch and spread over the mitigation areas.

All mulched native vegetation removed during construction will be stockpiled if it is to be used on site. Mulch from various vegetation types will be stored separately to ensure use in the correct

area during mitigation implementation. The mulch will be spread in piles no higher than 3 vertical feet for storage until use. The piles will not be tarped or covered and should not be irrigated. Irrigating the piles may cause any viable seed to sprout in place. The stockpiled mulch shall be stored in the upland portion of the project site adjacent to the stockpiled topsoil. Orange construction fencing shall be placed around the stockpiled mulch as a BMP, and the words "salvaged mulch," along with the name of the vegetation type from which the mulch was created, shall be posted on signage around the pile. If mulch is stockpiled in an area that contains weeds/weed seed, the top 8 inches of soil shall be stripped before stockpiling the mulch to avoid seed contamination.

If recently created mulch cannot be found or attained, a possibility exists that some viable native seed/propagules may survive until mitigation site installation in mulch created on site. However, it is anticipated that there will be a significant period of time between harvest and installation, resulting in viable plant matter deteriorating and losing viability. The mulch will primarily provide organic matter to the soil and secondarily provide a source of viable seed or root/shoot sprouting.

4.5.5 Soil Salvaging

Following clearing and grubbing work, the topsoil may be salvaged from native vegetation areas impacted by project construction. If there exists a high proportion of weeds in the herbaceous layer, the top 5 to 6 inches will be stripped and used as backfill subsoil or removed from the area. Removal of the top few inches of soil will help reduce the amount of weeds that may germinate within the restoration areas. The soil in the region generally is relatively deep sandy alluvium, so removal of the top few inches should not negatively affect the edaphic conditions.

Soil shall be salvaged to a depth of 12 inches and stockpiled on site. The stockpiled topsoil shall be stored in the upland portion of the project site adjacent to the stockpiled mulch. Silt fencing shall be placed around the stockpiled topsoil as a BMP, and the stockpile shall be clearly marked. If topsoil is stockpiled in an area that contains weeds/weed seed, the top 8 inches of soil shall be stripped before stockpiling the topsoil to avoid seed contamination. In addition, if weeds are present and blooming during the time the soil is stockpiled, the soil shall either be covered with clear plastic, or a 30-foot-wide weed-free band shall be kept around the stockpiled soil. "Grow and kill" cycles are planned to ensure that any weed seeds in the salvaged soil are minimized after irrigation installation and prior to planting.

Soil salvage and replacement is particularly important for mitigation sites where a buried bank structure is planned. Salvaging the topsoil will help improve edaphic conditions for native seed

germination, plant growth, and native vegetation establishment within the mitigation areas. Soil salvaging will also help to preserve soil biota, including mycorrhizal fungi. Once the salvaged soil is graded, but prior to planting, soil tests will be completed to test for suitable growing conditions. The results of soil suitability tests will determine the necessity of soil amendments, fertilizers, and/or mycorrhizae additions.

Topsoil placement and final grading shall be monitored and approved by the project biologist.

4.5.6 Grading and Site Preparation

Grading of the mitigation areas that require such activities will be accomplished during general site development and bank stabilization construction activities. Upon completion of bank protection construction work, the final grades within the restoration areas shall be established by grading the entire creation area to elevations conducive to native habitat establishment. Topsoil salvaged during grading operations shall be dispersed over the restoration areas to a depth of approximately 12 inches and utilized to create the finished grade conditions. Any soils within the restoration areas that are deemed compacted by the project biologist shall be ripped and/or disked to a depth of 12 inches in two opposing directions and floated out to the satisfaction of the project biologist. Topographic contours of the mitigation area will include swales and hummocks that mimic the natural environment. A low-flow channel will be constructed in order to create appropriate river wash conditions.

If the quantity of salvaged topsoil is less than expected and is not enough to satisfy the above condition requiring soils to be spread approximately 12 inches thick, then salvaged soils will be placed in higher-priority locations. Since one of the main purposes of salvaging topsoil is to improve soil fertility, high priority for salvaged topsoil would be given to areas graded to a greater depth that would be more likely to have lower soil fertility. Low-priority areas to receive salvaged topsoil include shallowly graded areas and areas where flooding poses a threat to wash newly laid soil away. If these measures still cannot compensate for less salvaged soil than expected, then salvaged soil may be spread at a thickness that will cover all areas of higher priority.

4.5.7 Weed Removal

This section addresses control of weeds within the project area during project installation. Prior to project installation, the mitigation sites must be free of invasive non-native annual grasses and forbs, as well as persistent perennial exotic species such as giant reed and tamarisk (*Tamarix ramosissima*). Mitigation sites that will require the existing soil to be removed and replaced will

likely reduce the weed seed bank. However, if there is a significant lag time between initial excavation and mitigation project installation, it is possible that weeds may recruit and reproduce within that time period.

Following installation of the irrigation system and prior to installation of plant material, "grow and kill" weed removal treatments will be conducted by the restoration contractor. "Grow and kill" cycles begin with irrigation over an approximately 2-week period to encourage non-native seedling emergence. Once weeds begin to germinate and grow, a foliar application of an appropriate herbicide is applied to kill target weeds. Additional "grow and kill" cycles may be required, as recommended by the project biologist.

Weed control will require a combination of physical, chemical, and cultural control methods. The project biologist will coordinate with the restoration contractor/pesticide applicator to identify specific locations where weed control is necessary and which control methods are appropriate for the site conditions and target species. Any chemical use should be conducted using methods that minimize effects to adjacent/desirable native species.

All weed control and removal work shall be performed in compliance with all applicable federal and state laws and regulations, safety precautions, and pesticide label directions. The restoration contractor shall possess a valid California Qualified Applicator Certificate or Qualified Applicator License, and Pest Control Business License or Maintenance Gardener Pest Control Business License, as appropriate for the situation.

The restoration contractor shall refer to the specific pesticide label for information on proper timing, application rates, and any use restrictions. The restoration contractor must follow all applicable label directions, laws, regulations, and safety precautions when performing weed control. Should the restoration contractor require a specific weed control recommendation for any control effort, he or she shall consult a licensed pest control adviser for a written recommendation.

4.6 Planting Plan

The planting plan will vary for each mitigation area depending upon site-specific conditions related to hydrology and soils. More detailed planting plans will be defined in each site-specific wetlands mitigation plan to be submitted with each construction notification package. Representative plant palettes are shown in Tables 9 through 19. The distribution of vegetation community types is shown on Figure 4. Planting will follow grading, installation of salvaged soil and mulch, irrigation system installation, and "grow and kill" weed-control cycles.

The plant palettes have been designed to represent the composition of species that occur within the impacted vegetation communities and to create additional appropriate native vegetation communities through a formulated composition of container stock and seed mix. The species included are important components of the revegetation program. However, site-specific adjustments (*e.g.*, seeding rates, species composition) to these generalized planting palettes may be made as deemed appropriate by the project biologist. Associated with the mitigation plantings in riparian areas, site-specific wetlands mitigation plans may incorporate southern California black walnut (*Juglans californica*) in appropriate areas to meet the requirement for 3:1 replacement of any southern California black walnut impacted by the project.

Table 9
Southern Cottonwood–Willow Riparian Plant Palette

Seed Mix			
Scientific Name	Common Name	Minimum Percent Live Seed	Application Rate (pounds/acre)
Ambrosia acanthicarpa	Annual bursage	60	1
Amsinckia menziesii	Yellow fiddleneck	25	1
Artemisia douglasiana	Mugwort	10	2
A. dracunculus	Tarragon	10	1
Clarkia purpurea	Winecup clarkia	80	1
Elymus glaucus	Blue wildrye	85	2
Eriogonum gracile var. *gracile*	Buckwheat	15	1
E. fasciculatum	California buckwheat	10	2
Gnaphalium californicum	California everlasting	2	1
Isocoma menziesii	Goldenbush	15	2
Lasthenia californica	Coast goldfields	50	1
Layia platyglossa	Tidy tips	60	1
Leymus triticoides	Creeping wild rye	80	1
Lupinus bicolor	Lindley's annual lupine	90	2
Mimulus aurantiacus	Bush monkeyflower	2	2
Phacelia cicutaria	caterpillar phacelia	80	1
Verbena lasiostachys	Western verbena	50	1
		Total pounds/acre	**23**

Table 9 (Continued)

Container Plants			
Scientific Name	**Common Name**	**Size**	**Spacing (feet on center)**
Baccharis salicifolia	Mulefat	1 gallon	8
Ericameria palmeri var. *pachylepis*	Goldenbush	1 gallon	6
Leymus condensatus	Giant wild rye	1 gallon	6
Pluchea sericea	Arrow weed	1 gallon	8
Populus fremontii	Fremont cottonwood	1 gallon	20
Quercus agrifolia	Coast live oak	1 gallon	25
Rhus trilobata	Skunkbrush	1 gallon	4
Ribes aureum	Golden currant	1 gallon	6
Salix exigua	Sandbar willow	1 gallon	10
S. laevigata	Red willow	1 gallon	12
S. lasiolepis	Arroyo willow	1 gallon	14
Salvia mellifera	Black sage	1 gallon	6
Sambucus mexicana	Mexican elderberry	1 gallon	12

Table 10
Mulefat Scrub Plant Palette

Seed Mix			
Scientific Name	**Common Name**	**Minimum Percent Live Seed**	**Rate (pounds/acre)**
Ambrosia acanthicarpa	Annual bursage	60	1.0
Artemisia douglasiana	Mugwort	10	2.0
Iva axillaris	Poverty weed	15	2.0
Lessingia glandulifera	Lessingia	80	1.0
Phacelia cicutaria	caterpillar phacelia	80	1.0
Pluchea odorata	Marsh fleabane	15	0.5
Senecio flaccidus var. *douglasii*	Butterweed	5	5.0
		Total pounds/acre	**12.5**

Container Plants			
Scientific Name	**Common Name**	**Size**	**Spacing (feet on center)**
Baccharis salicifolia	Mulefat	1 gallon	8
Eriodictyon crassifolium var. *nigrescens*	Yerba santa	1 gallon	6
Opuntia basilaris var. *ramosa*	Beaver-tail cactus	1 gallon	6
Pluchea sericea	Arrow weed	1 gallon	8
Ribes aureum	Golden currant	1 gallon	6
Salix exigua	Sandbar willow	1 gallon	10
S. lasiolepis	Arroyo willow	1 gallon	14
Sambucus mexicanus	Mexican elderberry	1 gallon	12

Table 11
Arrow Weed Scrub Plant Palette

Seed Mix			
Scientific Name	Common Name	Minimum Percent Live Seed	Rate (pounds/acre)
Ambrosia acanthicarpa	Annual bursage	60	1
Artemisia californica	California sagebrush	10	1
A. tridentata	Big sagebrush	10	2
Atriplex canescens ssp. *canescens*	Four-wing saltbush	35	1
Clarkia purpurea	Winecup clarkia	80	1
Eriogonum gracile var. *gracile*	Buckwheat	15	1
E. fasciculatum	California buckwheat	10	5
Leymus triticoides	Alkali rye	80	1
L. condensatus	Giant wild rye	70	2
Phacelia cicutaria	caterpillar phacelia	80	1
		Total pounds/acre	16

Container Plants			
Scientific Name	Common Name	Size	Spacing (feet on center)
Baccharis salicifolia	Mulefat	1 gallon	8
Pluchea sericea	Arrow weed	1 gallon	8
Salix exigua	Sandbar willow	1 gallon	8

Table 12
Southern Coast Live Oak Riparian Forest Plant Palette

Seed Mix			
Scientific Name	Common Name	Minimum Percent Live Seed	Rate (pounds/acre)
Amsinckia menziesii var. *menziesii*	Yellow fiddleneck	25	1.0
Artemisia californica	California sagebrush	10	2.0
Bromus carinatus	California brome	85	6.0
Clarkia purpurea	Winecup clarkia	80	0.5
Collinsia heterophylla	Purple Chinese houses	85	2.0
Eriogonum gracile var. *gracile*	Buckwheat	15	1.0
E. fasciculatum	California buckwheat	10	6.0
Isocoma menziesii	Goldenbush	15	3.0
Lasthenia californica	Coast goldfields	50	0.5
Leymus triticoides	Alkali rye	80	3.0
Mimulus aurantiacus	Bush monkeyflower	2	2.0
Nassella cernua	Nodding needlegrass	75	3.0
Nemophila menziesii	Baby blue-eyes	75	2.0
Phacelia cicutaria	caterpillar phacelia	80	1.0
Trichostema lanatum	Woolly bluecurls	40	2.0
		Total pounds/acre	35.0

Table 12 (Continued)

Container Plants			
Scientific Name	Common Name	Size	Spacing (feet on center)
Juglans californica	Black walnut	1 gallon	20
Leymus condensatus	Giant rye grass	1 gallon	6
Marah macrocarpus	Wild cucumber	1 gallon	30
Opuntia littoralis	Coastal prickly-pear	1 gallon	6
Pluchea sericea	Arrow weed	1 gallon	8
Prunus ilicifolia	Holly-leaf cherry	1 gallon	12
Quercus agrifolia	Coast live oak	1 gallon	20
Rhus trilobata	Squaw bush	1 gallon	6
Ribes californicum	California gooseberry	1 gallon	6
Rosa californica	California rose	1 gallon	6
Sambucus mexicana	Mexican elderberry	1 gallon	12

Table 13
Big Sagebrush Scrub Plant Palette

Seed Mix			
Scientific Name	Common Name	Minimum Percent Live Seed	Rate (pounds/acre)
Artemisia tridentata ssp. *tridentata*	Big basin sagebrush	10	1
Atriplex canescens ssp. *canescens*	Four-wing saltbush	35	1
Chrysothamnus nauseosus	Rubber rabbit brush	10	3
Eriastrum densifolium	Perennial eriastrum	5	1
Eriogonum gracile var. *gracile*	Buckwheat	15	1
Gnaphalium californicum	California everlasting	2	1
Isocoma menziesii	Goldenbush	15	3
Lessingia glandulifera	Lessingia	80	1
Lupinus bicolor	Lindley's annual lupine	90	6
Phacelia cicutaria	caterpillar phacelia	80	2
		Total pounds/acre	**20**

Container Plants			
Scientific Name	Common Name	Size	Spacing (feet on center)
Artemisia tridentata ssp. *parishii*	Sagebrush	1 gallon	6
Artemisia tridentata ssp. *tridentata*	Great basin sagebrush	1 gallon	6
Opuntia californica var. *parkeri*	Cane cholla	1 gallon	6
Eriodictyon crassifolium var. *nigrescens*	Yerba santa	1 gallon	6
Eriogonum fasciculatum	Flat-topped buckwheat	1 gallon	6
Malacothamnus fasciculatus	Chaparral mallow	1 gallon	6
Prunus ilicifolia	Holly-leaf cherry	1 gallon	10
Quercus agrifolia	Coast live oak	1 gallon	25
Yucca whipplei	Our Lord's candle	1 gallon	6

Table 14
California Sagebrush Scrub Plant Palette

Seed Mix			
Scientific Name	**Common Name**	**Minimum Percent Live Seed**	**Rate (pounds/acre)**
Artemisia californica	California sagebrush	10	6
Brickellia californica	California brickellbush	3	2
Chaenactis glabriuscula	Yellow pincushion	10	2
Encelia actoni	Acton's encelia	15	5
Eriogonum fasciculatum	California buckwheat	10	6
Gnaphalium californicum	California everlasting	2	1
Isocoma menziesii	Goldenbush	15	2
Lasthenia californica	Coast goldfields	50	1
Lessingia glandulifera	Lessingia	80	1
Lotus scoparius var. *scoparius*	Deerweed	85	1
Lupinus bicolor	Lindley's annual lupine	90	6
Nassella lepida	Foothill needle grass	65	1
N. pulchra	Purple needlegrass	75	1
Phacelia cicutaria	caterpillar phacelia	80	1
Trichostema lanatum	Woolly bluecurls	5	4
		Total pounds/acre	**40**

Container Plants			
Scientific Name	**Common Name**	**Size**	**Spacing (feet on center)**
Artemisia californica	California sagebrush	1 gallon	5
Isomeris arborea	Bladderpod	1 gallon	6
Leymus condensatus	Giant wild rye	1 gallon	6
Malacothamnus fasciculatus	Chaparral mallow	1 gallon	5
Opuntia littoralis	Prickly-pear cactus	1 gallon	6
Ribes californicum	California gooseberry	1 gallon	5
Salvia leucophylla	Purple sage	1 gallon	6

Table 15
Cismontane Alkali Marsh Plant Palette

Seed Mix			
Scientific Name	Common Name	Minimum Percent Live Seed	Rate (pounds/acre)
Ambrosia psilostachya	Western ragweed	6	1.0
Atriplex canescens ssp. *canescens*	Four-wing saltbush	35	1.0
Distichlis spicata	Salt grass	70	4.0
Leymus triticoides	Alkali rye	80	1.0
Pluchea odorata	Marsh fleabane	15	0.5
		Total pounds/acre	7.5

Container Plants			
Scientific Name	Common Name	Size	Spacing (feet on center)
Anemopsis californica	Yerba mansa	1 gallon	3
Baccharis salicifolia	Mulefat	1 gallon	8
Distichlis spicata	Salt grass	liners	1
Juncus acutus ssp. *leopoldii*	Southwestern spiny rush	1 gallon	5
Juncus mexicana	Mexican rush	1 gallon	3
Malvella leprosa	Alkali mallow	1 gallon	3
Scirpus americanus	Winged three-square	1 gallon	3

Table 16
Southern Willow Scrub Plant Palette

Seed Mix			
Scientific Name	Common Name	Minimum Percent Live Seed	Application Rate (pounds/acre)
Artemisia douglasiana	Mugwort	10	2
A. dracunculus	Tarragon	10	1
Elymus glaucus	Blue wildrye	85	2
E. fasciculatum	California buckwheat	10	2
Gnaphalium californicum	California everlasting	2	1
Isocoma menziesii	Goldenbush	15	2
Lasthenia californica	Coast goldfields	50	1
Layia platyglossa	Tidy tips	60	1
Leymus triticoides	Creeping wild rye	80	1
Lupinus bicolor	Lindley's annual lupine	90	2
Mimulus aurantiacus	Bush monkeyflower	2	2
Verbena lasiostachys	Western verbena	50	1
		Total pounds/acre	18

Table 16 (Continued)

Container Plants			
Scientific Name	Common Name	Size	Spacing (feet on center)
Baccharis salicifolia	Mulefat	1 gallon	8
Leymus condensatus	Giant wild rye	1 gallon	6
Pluchea sericea	Arrow weed	1 gallon	8
Rhus trilobata	Skunkbrush	1 gallon	4
Ribes aureum	Golden currant	1 gallon	6
Salix exigua	Sandbar willow	1 gallon	10
S. laevigata	Red willow	1 gallon	12
S. lasiolepis	Arroyo willow	1 gallon	12
Sambucus mexicana	Mexican elderberry	1 gallon	12

Table 17
Herbaceous Wetlands Plant Palette

Seed Mix			
Scientific Name	Common Name	Minimum Percent Live Seed	Rate (pounds/acre)
Ambrosia psilostachya	Western ragweed	6	2
Distichlis spicata	Salt grass	70	3
Leymus triticoides	Alkali rye	80	2
Pluchea odorata	Marsh fleabane	15	1
		Total pounds/acre	8

Container Plants			
Scientific Name	Common Name	Size	Spacing (feet on center)
Anemopsis californica	Yerba mansa	1 gallon	3
Baccharis salicifolia	Mulefat	1 gallon	10
Juncus mexicana	Mexican rush	1 gallon	3
Pluchea sericea	Arrow weed	1 gallon	10
Salix exigua	Sandbar willow	1 gallon	10
Scirpus americanus	Winged three-square	1 gallon	3

Table 18
Alluvial Scrub Plant Palette

Seed Mix			
Scientific Name	Common Name	Minimum Percent Live Seed	Rate (pounds/acre)
Artemisia tridentata ssp. *tridentata*	Big basin sagebrush	10	1
Atriplex canescens ssp. *canescens*	Four-wing saltbush	35	1
Chrysothamnus nauseosus	Rubber rabbit brush	10	3
Eriastrum densifolium	Perennial eriastrum	5	1
Eriogonum fasciculatum	California buckwheat	15	4
Gnaphalium californicum	California everlasting	2	1
Isocoma menziesii	Goldenbush	15	3
Lessingia glandulifera	Lessingia	80	1
Lupinus bicolor	Lindley's annual lupine	90	2
Phacelia cicutaria	NCN	80	2
		Total pounds/acre	**19**

Container Plants			
Scientific Name	Common Name	Size	Spacing (feet on center)
Artemisia tridentata ssp. *tridentata*	Great basin sagebrush	1 gallon	6
Eriodictyon crassifolium var. *nigrescens*	Yerba santa	1 gallon	6
Eriogonum fasciculatum	California buckwheat	1 gallon	6
Yucca whipplei	Our Lord's candle	1 gallon	6

Table 19
Mexican Elderberry Scrub Plant Palette

Seed Mix			
Scientific Name	Common Name	Minimum Percent Live Seed	Rate (pounds/acre)
Amsinckia menziesii var. *menziesii*	Yellow fiddleneck	25	1.0
Artemisia californica	California sagebrush	10	2.0
Bromus carinatus	California brome	85	6.0
Clarkia purpurea	Winecup clarkia	80	0.5
Collinsia heterophylla	Purple Chinese houses	85	2.0
E. fasciculatum	California buckwheat	10	6.0
Lasthenia californica	Coast goldfields	50	0.5
L. condensatus	Giant wild rye	70	2.0
Mimulus aurantiacus	Bush monkeyflower	2	2.0
Nassella cernua	Nodding needlegrass	75	3.0
Nemophila menziesii	Baby blue-eyes	75	2.0
Phacelia cicutaria	caterpillar phacelia	80	1.0
Trichostema lanatum	Woolly bluecurls	40	2.0
		Total pounds/acre	**30.0**

Table 19 (Continued)

Container Plants			
Scientific Name	Common Name	Size	Spacing (feet on center)
Juglans californica	Black walnut	1 gallon	20
Leymus condensatus	Giant rye grass	1 gallon	6
Marah macrocarpus	Wild cucumber	1 gallon	30
Prunus ilicifolia	Holly-leaf cherry	1 gallon	12
Quercus agrifolia	Coast live oak	1 gallon	20
Rhus trilobata	Squaw bush	1 gallon	6
Ribes californicum	California gooseberry	1 gallon	6
Rosa californica	California rose	1 gallon	6
Sambucus mexicana	Mexican elderberry	1 gallon	10

4.6.1 Container Planting

Plant materials used to implement the planting plan will generally include 1-gallon container stock, mulched material, and native seed as indicated in Tables 9 through 19. All container plants will be checked for viability and general health upon arrival at the mitigation site by the project biologist. Plant materials not meeting acceptable standards will be rejected. Plant species and quantities will be confirmed after delivery by the project biologist. General locations for installation will be designated on the construction documents. Specific locations for installation will be designated on planting plans or marked on site temporarily with pin flags by the project biologist.

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 post hole digger or power auger. Holes will be filled with water and allowed to drain immediately prior to planting. Backfill soil containing amendments (as directed by the project biologist) will be placed in every planting hole following soaking, with the top of the root ball entirely below grade. Some woody wetland species (*e.g.*, willows) specified by the project biologist will be planted into the soil slightly deeper than this standard, approximately 2 to 4 inches above the root collar of the plant. This additional planting depth for these species will help ensure greater rooting strength and provide additional protection against seasonal scour and/or uprooting due to high flow velocities after winter storm events.

Mulch will be raked around installed container plants to a diameter of 2 feet or 1.5 times the drip line, whichever is greater. Mulch will be 3 to 4 inches deep. This mulch is in addition to the mulch made from salvaging native material from on site. Herbivory cages are not expected to be necessary, as a certain level of herbivory is planned for and built into plant palettes. Should

herbivory increase beyond expected amounts, the project biologist has the ability to take steps to counteract herbivory. See **Section 8.5.1** for more information on addressing herbivory problems.

4.6.2 Seed Application (Hydroseed and/or Drill Seeding)

Following container plant installation, mitigation areas will be stabilized with specified hydroseed mixes (Tables 9 to 19) and a light application of a soil binder, primarily for erosion control. Individual mixes have been prescribed for different vegetation communities. Labels for each mixture will be inspected and approved by the project biologist prior to mixing and application. All mixes are to include the specified seed mix at the prescribed rate per acre, virgin wood cellulose fiber mulch at 2,000 pounds per acre (if applicable), commercial fertilizer at the specified rate as directed by the project biologist during finish grading, and a commercial binder ("Guar gum," "super tack," or equivalent) at 100 pounds per acre.

Applying seed via hydroseed instead of drill seeding will allow for the installation of the irrigation system prior to "grow and kill" cycles being conducted before seeding. Irrigation during the "grow and kill" cycles will greatly increase the germination among weeds and improve the ability to remove them from the seed bank.

Drill seeding may be useful in areas where an irrigation system is not being installed (*i.e.*, the temporary mitigation areas) if/when seeding is decided to be necessary. If drill seeding is decided upon as the method of application, it must be done prior to container planting, which could be done immediately after the drill seeding.

4.7 Irrigation Plan

The primary goal of this Plan is to establish native vegetation communities capable of maintaining and supporting themselves in perpetuity. However, native container plants and seed may require irrigation for establishment on the mitigation site, especially during summer months. When an irrigation system is deemed appropriate and necessary, a temporary aboveground overhead spray irrigation system will be installed. Where necessary, drip irrigation may also be used to deliver irrigation water directly to woody container plantings. The irrigation system shall be utilized to support the container stock plantings and seed mixtures until they can survive on their own based on observed and predicted seasonal rainfall and effective plant rooting depth.

All irrigation will be installed by the restoration contractor according to the construction documents and specifications associated with the project-specific mitigation plans. The irrigation systems will be designed with aboveground components to facilitate removal once the system is decommissioned.

Irrigation will be used during the plant establishment period of the project. It is planned that irrigation use will be discontinued at least 3 years before the end of the 5-year maintenance period to demonstrate the self-sustainability of the established vegetation communities.

Irrigation design and layout will be provided with the final construction plans. The irrigation systems may utilize a series of solar- or battery-operated controllers that operate independent irrigation circuits, minimizing irrigation maintenance requirements for the site. Irrigation on site will likely consist of polyvinyl chloride piping staked at grade with coverage provided by spray heads.

Consideration shall be taken to keep irrigation components out of the way of flood disturbance. Should portions of the irrigation systems become damaged or lost due to unforeseen flood events, the restoration contractor will be required to replace lost components and/or modify the design based on recommendation of the project biologist.

4.8 Construction Drawings and As-Built Conditions

Following approval of this wetlands mitigation plan and subsequent site-specific wetlands mitigation plans, a final design will be prepared and integrated into construction drawings and specifications. Construction documents will incorporate the most current site condition information available. The plan package will include a site plan showing proposed work areas, construction details, irrigation and planting plans, and any additional grading. Construction documents shall provide location and details of any resource agency–required signage or access restrictions.

Specifications shall define the scope of mitigation construction activities, the quality and type of materials to be used, permit requirements, specific performance-based standards of construction quality, and, when appropriate, specific required construction methodologies. Specifications shall be prepared in a recognized industry format such as Construction Standards Institute (CSI) format or Greenbook.

As-built plans for individual mitigation projects will be required only if the installation of the mitigation project substantially deviates from the approved site-specific wetlands mitigation plan and/or construction documents. If necessary, as-built plans will reflect changes to the configuration of vegetation community areas and site elevations that may affect project success. As-built plans will include field recordation of final mitigation site limits and geographic information system–based record mapping of mitigation sites down to the vegetation community level.

5.0 MAINTENANCE ACTIVITIES DURING THE MONITORING PERIOD

Because the goal of the maintenance and monitoring plan is to establish a natural riparian system that can support itself without maintenance, the primary effort of the maintenance plan is concentrated in the first few seasons of plant growth when weeds can easily outcompete native plants. The intensity of the maintenance activity is expected to subside each year as the native plant materials become more established and as local competition from non-native plants for resources in the mitigation areas is minimized through ongoing control.

5.1 Maintenance Activities

Maintenance activities will be conducted concurrently with the installation of the mulch, container plants, and seed materials in the mitigation areas and will continue throughout the initial 120-day establishment period and through the 5-year maintenance and monitoring period, concluding once success criteria have been met.

5.1.1 Weed Control

Ongoing weed control activities will occur within the mitigation areas throughout the 5-year maintenance period. All debris and slash generated from weed-removal activities will be disposed of off site in a legally acceptable manner. The goal of the weed control efforts will be to maintain the project with less than 5% cover of non-native plant species for the 5-year maintenance period.

Target weed species include all perennial exotic and weedy annual forb species listed on the Cal-Invasive Plant Council *California Invasive Plant Inventory* (Cal-IPC 2006, 2007). Specific focus will be on species that pose a risk to the development of the planned vegetation communities. Appropriate measures for control will be determined based on current literature and known methods of control.

Weed-control measures may include direct physical or mechanical removal (*e.g.*, cutting with weed whip machines, mowing) and herbicide application. Weeding will be performed as recommended by the project biologist to keep any weeds establishing on the mitigation site at manageable levels. Specified weed species will be controlled before seed-set. (Other species that appear may need to be controlled if deemed necessary by the project biologist.)

Non-native grasses will be controlled within the project boundaries during the 5-year monitoring period, but complete eradication may not be possible due to the ubiquitous nature of their

distribution within the region. Presence of non-native grasses will not be used as a criterion for project success. Herbicide control will be used for persistent plant species specified by the project biologist, as well as any additional perennial species that are low-growing and are difficult to control by other methods. The restoration contractor should coordinate with the project biologist and Newhall Land to identify specific sites where chemical herbicide may be used. Any herbicide treatment must be specified by a licensed pest control adviser and applied by a licensed pest control applicator.

5.1.2 Trash Removal

Trash will be removed from the mitigation areas during maintenance visits. Trash consists of all man-made materials, equipment, or debris dumped, thrown, washed, blown, and left within the mitigation areas. Trash and inorganic debris washed or blown onto the mitigation site will be removed regularly. Deadwood and leaf litter from native trees and shrubs will not be removed. Downed logs and leaf litter provide valuable microhabitats for invertebrates, reptiles, small mammals, and birds. In addition, the decomposition of deadwood and leaf litter is essential for the replenishment of soil nutrients and minerals.

5.1.3 Irrigation Maintenance

Mitigation areas may be irrigated to promote plant survival during the drier parts of the year, primarily the summer months. Irrigation may be used in winter months to simulate an average or above-average rain season if natural precipitation is lacking. It is expected that the irrigation system will be utilized for a maximum of 2 years, excepting conditions for implementation of adaptive management activities. Irrigation volume will be gradually reduced over time to acclimate plants to a non-irrigated condition prior to complete cessation of irrigation. Irrigation from June to November may be minimized to allow plants to experience normal drought cycles and to promote appropriate root growth. The restoration contractor will maintain the irrigation system at the optimum level of operation.

Consultation with the project biologist will be necessary to determine the timing for the cessation of irrigation. Irrigation should stop at the earliest possible date without risking substantial loss of plantings. It is expected that the irrigation system will be abandoned no earlier than the end of Year 1. Irrigation will most likely be discontinued by the end of Year 2 of the 5-year monitoring and maintenance period. Irrigation components, such as valves and sprinkler heads, may be salvaged for reuse elsewhere at the end of the establishment period. As previously stated, if irrigation is deemed necessary beyond Year 2, adaptive management methods may be necessary to bring the project up to success criteria.

5.2 Responsible Parties

The responsible parties described in **Section 1.1** are also responsible for the performance of maintenance during the monitoring period.

5.3 Schedule

The maintenance schedule will commence once the mitigation construction is complete and accepted by the owner. Maintenance activities will be performed on a monthly basis for the first 120 days after installation. Thereafter, the frequency of maintenance activities may be decreased as appropriate to a minimum of quarterly, depending on factors such as native vegetation development, size and diversity of non-native populations, legacy weed seed bank, presence of trash, irrigation schedule, public access, *etc.* A detailed maintenance schedule will be prepared and presented in each site-specific wetlands mitigation plan to be included in each construction notification package.

6.0 MONITORING PLAN FOR THE COMPENSATORY MITIGATION SITES

The purposes of monitoring of the mitigation sites are to: (1) monitor the progress of the native revegetation area by assessing whether native vegetation establishment has achieved the performance criteria established for the project, and (2) direct and monitor the maintenance activities and determine remedial actions in a manner that ensures that appropriate maintenance occurs in a timely manner. The monitoring shall be performed by a qualified biologist or habitat restoration specialist. Following installation at the mitigation sites, monitoring shall be required for 5 years or until success criteria are met.

The project biologist shall be responsible for monitoring the activities of all contractors associated with mitigation implementation during finish grading, soil amending, irrigation installation, mulch application, container planting, and seeding; for monthly monitoring during the 120-day plant establishment/maintenance period; and for quarterly and semi-annual monitoring during the 5-year maintenance and monitoring period. The project biologist will communicate and coordinate with the restoration contractor to ensure the timely performance of project activities. The project biologist shall submit progress reports to Newhall Land during installation and 5-year monitoring site visits, and annual reports to the Corps and the applicant each year on the anniversary date during the 5-year monitoring period. The mitigation project areas shall be accessible to Corps staff throughout project review and installation and during the 5-year maintenance and monitoring period.

6.1 Performance Standards for Target Dates and Success Criteria

The mitigation sites will be considered "complete" upon meeting all of the following success criteria. In a construction notification letter, the applicant may request modification of success criteria on a project-by-project basis. Acceptance of such requests will be at the discretion of the Corps.

- Regardless of the date of initial planting, any restoration site must have been without active manipulation by irrigation, planting, or seeding for a minimum of 3 years prior to CDFG and the Corps' consideration of successful completion.
- The percent cover and species richness of native vegetation shall be evaluated based on local reference sites for the plant communities in the impacted areas.
- Native shrubs and trees shall have at least 80% survivorship after 2 years beyond the beginning of the success evaluation start date. This may include natural recruitment.
- Non-native species cover will be no more than 5% absolute cover through the term of the restoration.
- Giant reed, tamarisk, perennial pepperweed (*Lepidium latifolium*), tree of heaven (*Ailanthus altissima*), pampas grass (*Cortaderia selloana),* and any species listed on the California State Agricultural list, or Cal-IPC list of noxious weeds will be controlled on the revegetation site as of the date of completion approval.
- Using the HARC assessment methodology described in **Subsection 2.1.1**, or other approved functional assessment methodology, the compensatory mitigation site shall meet or exceed the baseline functional scores (HARC AW-score units) of the impact area in jurisdictional waters of the United States. If the compensatory mitigation site cannot meet or exceed the baseline functional score of the impact area (HARC AW-score units) in jurisdictional waters of the United States, additional mitigation area may be required to compensate for the functional loss.

Example performance criteria have been established for three planned vegetation communities: southern cottonwood–willow riparian, arrow weed scrub, and mulefat scrub. The criteria are based upon expected vegetative development within properly functioning native vegetation of the same type and are listed in Table 20. Depending on specific site conditions at the planned mitigation site, these performance criteria may be revised in final mitigation plans to characterize the best achievable standards at the individual sites. Performance criteria for additional vegetation communities not shown here will be developed during the preparation of site-specific mitigation plans and will be based on reference communities of the same type and occurring within similar conditions.

Performance criteria will be utilized to assess the annual progress of the restoration areas and are regarded as interim project objectives designed to achieve the final goals. Fulfillment of performance criteria will indicate that the mitigation areas on the project site are progressing toward the vegetation community types and functions that constitute the long-term goals of the plan. Performance criteria for areas permanently impacted (creation areas) include a minimum container plant survivorship, an average height requirement of planted tree species, and a minimum required native plant cover. Performance criteria for vegetative cover within river wash have not been established because the ultimate goal is to recreate the mostly barren nature of the vegetation community type and the routine scouring. Performance criteria for temporarily impacted areas (revegetation areas) include minimum container plant survivorship, an average height requirement of planted tree species, and a minimum required native plant cover (Table 21).

Table 20
Performance Guidelines for Creation Areas (Permanent Impact)

Criteria	Year 1[1]	Year 2	Year 3	Year 4	Year 5
Container plant survival[2]	100%	80%	80%	70%	70%
Container Tree Heights					
Fremont cottonwood	4 ft	6 ft	8 ft	10 ft	12 ft
Coast live oak	2 ft	3 ft	4 ft	5 ft	6 ft
Arroyo willow	4 ft	6 ft	8 ft	10 ft	12 ft
Sandbar willow	2 ft	3 ft	4 ft	5 ft	6 ft
Vegetative Cover					
Southern cottonwood–willow riparian	15%	30%	40%	60%	80%
Arrow weed scrub	10%	20%	35%	55%	75%
Mulefat scrub	10%	20%	25%	40%	50%
Southern coast live oak riparian forest	15%	25%	35%	50%	70%
Perennial non-native/exotic cover[3]	0%	0%	0%	0%	0%

[1] Percentages based upon visual estimates.
[2] All dead plants shall be replaced unless their function is anticipated to be performed by natural recruitment.
[3] The cover of non-native plant species at the mitigation sites shall not exceed 5% at any time within the 5-year maintenance period.

Table 21
Performance Guidelines for Revegetation Areas (Temporary Impact)

Criteria	Year 1[1]	Year 2	Year 3	Year 4	Year 5
Container plant survival[2]	—	100%[4]	80%[4]	80%[4]	70%[4]
Container Tree Heights					
Fremont cottonwood	—	4 ft[4]	6 ft[4]	8 ft[4]	10 ft[4]
Arroyo willow	—	4 ft[4]	6 ft[4]	8 ft[4]	10 ft[4]
Sandbar willow	—	2 ft[4]	3 ft[4]	4 ft[4]	5 ft[4]
Native Cover					
Southern cottonwood–willow riparian	15%	30%	45%	60%	80%
Arrow weed scrub	10%	20%	35%	55%	75%
Mulefat scrub	10%	20%	25%	40%	50%
Perennial non-native/exotic cover[3]	0%	0%	0%	0%	0%

[1] Percentages based upon visual estimates.
[2] All dead plants shall be replaced unless their function is being performed or is reasonably anticipated to be performed by natural recruitment.
[3] The cover of non-native plant species at the mitigation sites shall not exceed 5% at any time within the 5-year maintenance period.
[4] Only required if native cover does not reach target native cover at the end of Year 1 and if the project biologist recommends remedial seeding/planting.

If mitigation efforts fail to meet the performance standards listed in any one year, the project biologist may recommend remedial actions to be implemented (*e.g.*, supplemental planting, seeding, transplanting) that will enhance the vegetation communities to a level in conformance with these standards. In addition, if native plant cover does not reach 50% of the pre-construction plant cover in the revegetation areas, these areas will be revegetated. River wash will not need to reach 50% of the pre-construction plant cover due to expected periodic scouring. Scouring is a regular disturbance with this vegetation community that makes predicting plant cover impossible. Scouring will provide new seeds/propagules to replace the plants that are swept away.

6.2 Target Functions and Values

The functions and services of the mitigation sites will be evaluated using the HARC assessment methodology (Appendix B), or other approved functional assessment methodology. If the compensatory mitigation site cannot meet or exceed the baseline functional score of the impact area, additional mitigation area may be required to compensate for the functional loss.

6.2.1 Functional Assessment Success Criteria

A functional assessment of the mitigation sites will be conducted annually and compared with the baseline functional scores of the impact area covered by the mitigation site. The success of

the mitigation area will be judged in part by the functional assessment scores that are achieved. For each planned mitigation area, the target functional assessment scores will be derived from the HARC AW-score units. The target functional assessment scores for each phase are included in Table 22 and are the same value as the baseline values. However, in terms of actual achievement and application of HARC AW-score units, credits may come from various project phases, including the planned pre-mitigation at Salt Creek and Mayo Crossing (see Table 8).

Table 22
Target Functional Assessment HARC AW-Score Units for Each Phase

Phase	Baseline Average HARC Score	Baseline HARC AW-score Units Impacted	Target HARC AW-score Units
Phase 1 Landmark Village			
Permanent Impacts	0.52	3.4	3.4
Temporary Impacts	0.64	2.1	2.1
		Phase 1 Total	*5.5*
Phase 2 Mission Village			
Permanent Impacts	0.67	13.1	13.1
Temporary Impacts	0.79	5.2	5.2
		Phase 2 Total	*18.3*
Phase 3 WRP Utility Corridor			
Permanent Impacts	0.49	0.9	0.9
Temporary Impacts	0.82	2.5	2.5
		Phase 3 Total	*3.4*
Phase 4 Homestead Village South			
Permanent Impacts	0.72	5.7	5.7
Temporary Impacts	0.80	0.8	0.8
		Phase 4 Total	*6.4*
Phase 5 Homestead Village North			
Permanent Impacts	0.52	4.5	4.5
Temporary Impacts	0.73	3.4	3.4
		Phase 5 Total	*7.9*
Phase 6 Potrero Village			
Permanent Impacts	0.81	17.6	17.6
Temporary Impacts	0.77	4.9	4.9
		Phase 6 Total	*22.5*
		Combined Phases Total	**64.0**
		Permanent Impacts	45.2
		Temporary Impacts	18.9

Note: Totals may not add due to rounding.

6.3 Target Hydrologic Regime

Target hydrologic regimes are intended to mimic the pre-construction hydrology conditions. These targets vary depending upon location (*i.e.*, river or tributary). For each project, the site-specific wetlands mitigation plan will include a description of the anticipated post-project hydrology system characteristics and how the system will support the target wetlands vegetation communities. Generally, the target regime for tributaries will be maintained through appropriate connections to headwater areas of the tributary drainages. Urban runoff will be controlled by water quality basins that will collect stormwater before discharge into the tributary drainage. The passage of stormwater through these basins will regulate the flow of runoff into tributary drainages, thereby more closely managing the peak flows. River hydrology will remain unchanged for mitigation sites along the main river channel.

6.4 Target Jurisdictional and Non-Jurisdictional Acreages to be Established, Restored, Enhanced, and/or Preserved

A variety of vegetation types and jurisdictional areas will be created, restored, enhanced, and preserved throughout the Project area at designated mitigation sites. On-site (*i.e.*, in-place) mitigation is planned for each development phase for temporary impacts. Permanent impacts will be mitigated at the Mayo Crossing and Salt Creek creation sites and in the larger tributary drainages that are proposed for stabilization, regrading restoration, or creation as described above.

6.5 Monitoring Methods

After each site visit, a site observation report will be provided to Newhall Land and to the restoration contractor. The site observation report will include a description of the project status, site conditions, and any maintenance recommendations or remedial actions.

Monitoring of the mitigation areas will be performed by the project biologist during the 120-day establishment period and quarterly throughout the duration of the project. Both horticultural (qualitative) monitoring and biological (quantitative) monitoring will be conducted at the mitigation areas. Permanent photodocumentation stations will be established along each transect to record the progress of the mitigation sites and graphically record plant establishment over the 5-year period. In the annual report, the project biologist will provide a summary of results of the monitoring activities completed during the prior year.

6.5.1 Construction/Installation Monitoring

The project biologist will make regular site visits during key milestones associated with implementation of each mitigation project. The project biologist also will review activities for conformance to this plan, environmental permit conditions, and the requirements of contract plans and specifications. Each site observation visit will be documented in an observation report. Construction shall be photodocumented and will be included in observation reports, as needed.

6.5.2 120-Day Plant Establishment Period and Monitoring

Upon successful completion of project installation as determined by the project biologist, the 5-year monitoring phase will begin. During the first 120 days of the 5-year monitoring period, container plants will be monitored for health and vigor. Should any of the container plants die during the 120-day plant establishment period, they will be replaced in kind at the expense of the restoration contractor to 100% of the original quantity at the recommendation of the project biologist. Should seed/hydroseed fail to germinate within the 120-day plant establishment period, it shall be reapplied at the expense of the contractor at the recommendation of the project biologist. The project biologist will perform monitoring monthly (every 30 days) during the 120-day plant establishment period and will make recommendations to the contractor to ensure conformance with the 120-day plant establishment requirements.

6.5.3 Qualitative Monitoring

Data on native vegetation coverage, weed presence, and site progress will be collected during monitoring visits and used in the annual monitoring report. Qualitative monitoring will be conducted to assess native container plant vigor and development, seedling recruitment from native hydroseed and natural sources, soil moisture content, presence/absence of plant pests or diseases, erosion and/or drainage conditions on site, presence/absence of non-native or invasive plant species, trash or debris accumulation, wildlife presence/absence, and project fencing/signage. All qualitative monitoring visits to the mitigation site will be documented with a monitoring report, which will be forwarded to Newhall Land and the restoration contractor. Any project deficiencies will be noted in the monitoring report, with accompanying recommendations for maintenance or remedial actions.

6.5.4 Quantitative Monitoring

Quantitative monitoring will be conducted to determine container plant survivorship/mortality, total native species cover and composition, and total non-native species cover and composition. Quantitative monitoring will be conducted by establishing permanent vegetation transects within

the mitigation areas at random locations at the end of Year 1. These transects will be utilized to help determine achievement of the yearly performance standards. Permanent photodocumentation stations 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. A transect tape will be run between two posts, and a vegetative intercept line will be visually projected above and below the tape at every half-meter mark. Each native or non-native species that intercepts the projected line will be recorded. In addition to species, a vertical stratum for each "hit" will be recorded. Vertical strata include the herbaceous layer (0.0 to 1.0 meter), shrub layer (1.0 to 3.0 meters), and canopy layer (3.0 meters and higher). All plant species present within a 5-meter-wide "species richness" portion of each transect will be recorded. All data will be utilized to determine total percent plant cover, vertical structural diversity, percent native cover, percent non-native cover, overall species richness and diversity, and target species growth. Quantitative monitoring will be conducted once annually in the fall at the end of the growing season to capture the project's complete growth beginning in Year 2 and extending through Year 5 of the mitigation project. The project biologist will determine the appropriate number of transects to be installed on a site-by-site basis, but there shall be at least one transect per vegetation community type and at least one transect per every 3 acres. Transects will be 50 meters long, or the maximum length possible in areas with less than 50 linear meters available. Transect locations will be established by the project biologist.

6.6 Monitoring Schedule

Monitoring will be performed throughout the 5-year maintenance and monitoring period as defined in each site-specific wetlands mitigation plan to be prepared and included in construction notification packages. In general, qualitative monitoring will be conducted on a quarterly basis during the initial years of mitigation establishment followed by semi-annual monitoring in subsequent years until performance criteria are reached. Quantitative monitoring activities will be performed annually in the spring or summer months to collect vegetation data for analysis and inclusion in the annual monitoring report.

6.7 Annual Monitoring Reports

An annual monitoring report will be submitted to the permitting agencies during the 5-year maintenance and monitoring period for each individual mitigation project. The monitoring reports will describe the existing conditions of the mitigation areas derived from qualitative field observations and quantitative vegetation data collection. The reports will provide a comparison

of annual success criteria with field conditions; identify all shortcomings of the project and project implementation; and recommend remedial measures necessary for the successful completion of the mitigation project. Each yearly report will provide a summary of the accumulated data. Annual 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 monitoring activities
- A copy of the resource agency permits, any special conditions, and any subsequent letters of modification
- Prints of biological monitoring photographs
- Maps identifying monitoring areas, planting zones, and weed-removal areas as appropriate
- Quantitative data from transect measurements in Years 2 through 5 of the mitigation project.

The annual monitoring reports will be submitted to the resource agencies by April 1 of each year with the Annual Mitigation Status Report. The Annual Mitigation Status Report is required for projects installed under the Newhall Ranch Specific Plan, Mitigation Measure SP-4.6-9 (County of Los Angeles 2003), and shall be submitted for 5 years after all mitigation has been completed.

7.0 COMPLETION OF COMPENSATORY MITIGATION

At the conclusion of the scheduled maintenance and monitoring period for each mitigation site, a post-mitigation HARC evaluation will be conducted to determine the level of functions and values achieved. The average-weighted HARC scores for the mitigation areas will then be compared to the baseline average-weighted HARC scores for the impact areas that the mitigation site is compensating for. If multiple mitigation sites are evaluated together as components of a site-specific mitigation plan, or collective site-specific mitigation plans for multiple phases occurring within the same time period, then a comprehensive HARC score budgeting analysis will be conducted to ensure that the overall functions and values lost as a result of the development project are adequately compensated at the mitigation sites. In this type of comprehensive analysis, mitigation sites with greater HARC scores than baseline conditions may apply HARC score credit to mitigation sites that may have a lower HARC score than baseline conditions. Thus, if the overall balance of HARC scores for the collective mitigation sites meets or exceeds the baseline HARC scores of the areas impacted, then the mitigation will be considered successful at compensating for impacts.

7.1 Regulatory Agency Confirmation

Following receipt of the notification of completion, the Corps may visit the site to confirm the completion of the mitigation effort and may issue formal letters of success upon acceptance.

After the mitigation has been determined to be successful based on the analysis described above in **Section 7.0**, a final report will be prepared and submitted to the Corps. Upon submitting the annual report for the final year of each individual mitigation project, Newhall Land will notify the Corps that the final success criteria have been met and will request acceptance of the site. Acceptance of the site would then be provided to CDFG in support of the release of any financial security posted for the project (*e.g.*, letter of credit, bond, *etc.*), and confirmation that project mitigation has been satisfied. Early release may be possible if performance standards are met early and the resource agencies agree with the level of establishment. Removal of the irrigation system, temporary fencing, and signage would occur prior to final sign-off. In the event that Newhall Land gets no response from the permitting agencies within 60 days of submittal of the final report, Newhall Land will assume acceptance of the report. Newhall Land will then, at its option, formally notify the permitting agencies that the site has satisfied the agency permits and that no further maintenance or monitoring will be conducted (excepting that required by the RMDP), and Newhall Land may request immediate release of any financial securities held by any permitting agency for the project.

8.0 CONTINGENCY MEASURES

If the mitigation project does not meet the success criteria as defined in this Plan and as described in **Section 7.0**, then contingency measures may be implemented. The contingency measures may include remedial work to increase the functions and values of the mitigation site and/or the addition of mitigation land to compensate for the lost functions and values.

In accordance with Mitigation Measure BIO-7, if at any time prior to resource agency approval of the mitigation area, the site is subject to an act of God (flood, fires, or drought), the applicant shall be responsible for replanting the damaged area. The site will be subject to the same success criteria as provided for in Mitigation Measure BIO-6. Should a second act of God occur prior to Agency approval of the restoration area, the applicant shall coordinate with the Agencies and develop an alternative restoration strategy(ies) to meet success requirements. This may include mitigation elsewhere in the Santa Clara River corridor or tributaries.

8.1 Initiating Procedures

If performance criteria are not met for all or any portion of the mitigation projects or if the final success criteria are not met, the project biologist and Newhall Land will prepare an analysis of the cause(s) of failure within the appropriate annual report and, if determined necessary by permitting agencies, propose remedial action for agency approval. If the mitigation sites have not met the performance criteria by the end of the 5-year maintenance and monitoring period, Newhall Land's maintenance and monitoring obligations will continue until contingency measures are negotiated and implemented to bring the mitigation site into compliance with the established standards or until the permitting agencies grant final mitigation project permit compliance/approval.

8.2 Alternative Locations for Contingency Compensatory Mitigation

If a deficiency of Corps-jurisdictional acreage or functions and values is determined based on the analysis described in **Section 8.1**, then additional mitigation site options will be presented to the Corps and a plan for contingency measures will be negotiated. Potential locations for additional mitigation lands have been identified in the Homestead Village North and Potrero Village phases of development.

8.3 Funding Mechanism for Long-Term Management

In perpetuity, land stewardship activities on mitigation lands will be funded through a non-wasting endowment held by an agency-approved land management entity, in accordance with the Final EIS/EIR. A detailed cost estimate and Property Analysis Record (PAR) have been developed that itemize the long-term management tasks and calculate the value of the endowment necessary to generate adequate funds to cover estimated management costs. The cost estimate and PAR have been developed in conjunction with CDFG and the Center for Natural Lands Management (CNLM).

Upon establishment of the endowment, the long-term land stewardship activities will be conducted by the land management entity. These long-term stewardship activities are in addition to and, in some cases, will be conducted concurrent with, the near-term, bonded mitigation activities. Long-term land stewardship activities include general open space condition monitoring, exotic plant species monitoring and control, exotic animal species monitoring and control, patrolling and enforcement, general maintenance, reporting, operation, administration, contingency, and adaptive management.

8.4 Responsible Parties

Newhall Land, their successors, or assignees are responsible for all contingency efforts that are required to complete compensatory mitigation for each development phase of the RMDP.

8.5 Adaptive Management Plan

Adaptive management will be implemented in the event of unforeseen or probable but unpredictable circumstances. Adaptive management is defined, for the purposes of this Plan, 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 mitigation areas. Adaptive management will include the utilization of regular qualitative assessments and rapid quantitative assessment data gathered in the field prior to and during the mitigation project to assess the health and vigor of vegetation communities within the mitigation sites. Following an event that causes damage to all or part of a mitigation site, the data will be used in part to drive management considerations for repair of the damaged areas. Achieving the key goals of mitigation completion and establishment of self-sustaining native vegetation communities 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 mitigation site. Enhancement of adjacent disturbed vegetation within the Santa Clara River floodplain may be considered as an adaptive management measure in the event that certain vegetation communities are no longer supported at the project sites.

8.5.1 Herbivory

Some grazing and browsing by native mammals is expected to occur within the mitigation area. The plant palettes for each vegetation community have been designed to accommodate 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 or quantitative monitoring of the mitigation sites, remedial measures will have to be implemented. Browse guards (fencing) may be installed around the base of trees and young shrub container plants in affected areas to reduce plant mortality.

8.5.2 Flooding

Flooding is anticipated to occur on occasion within the mitigation areas. Flooding may periodically reduce overall plant cover within the stream channel. If quarterly monitoring of the channel indicates that cover is being reduced below tolerable levels, remedial planting or seeding

may be required. Additional mulch, cuttings, or container plants may be placed in strategic areas to address changed flow characteristics of the stream channel.

Due to the highly volatile nature of the Santa Clara River's flood regime, additional flow entrainment or velocity protection features may be recommended. In addition, vegetation communities with the lowest Manning's coefficient will be positioned in potential areas of highest flow rate in an attempt to reduce flood-related damage to the creation/restoration sites. In addition, larger tree trunks from clearing operations may be strategically placed to provide additional non-intrusive protection for mitigation areas, while also providing habitat for small mammals, reptiles, and other small wildlife.

8.5.3 Drought

Seasonal drought is a normal annual cycle in northern Los Angeles County, and all plant palettes have been designed with drought-tolerant plant species that are capable of withstanding seasonal fluctuations in available moisture. However, an extended drought could occur, including low seasonal rainfall and prolonged high temperatures that may negatively affect the mitigation sites (*e.g.,* cause lower native cover, higher plant mortality, or increased potential for pest infestations on site). Planned irrigation will reduce or eliminate the effects of drought on container plants and seedlings during the first 2 years of the mitigation projects. Any remedial options that may be necessary after 2 years from the installation date will likely require an additional period of site irrigation to relieve plants from drought stress and/or provide for new seed growth. All irrigation components may be left in place after Year 2, in case remedial seeding and/or container planting is/are required at a later project date. If the irrigation systems are required at a later date, irrigation should be used only as necessary (*i.e.*, periodic watering versus regular daily watering).

8.5.4 Wildfire/Geologic Events

In the event that a mitigation site or a portion of a mitigation site burns in a wildfire or suffers from mass movements (*e.g.*, landslides, slope sloughing, or other geologic events), the restoration biologist and/or Newhall Land shall promptly review the site and determine what action, if any, should be taken. The primary anticipated post-fire management activity involves monitoring the site and controlling annual weeds that may invade burned areas following a fire event, especially when such weeds were not previously present or were present in lower densities. If fire control lines or other forms of bulldozer damage occur in the mitigation sites, these areas would be repaired and revegetated to pre-burn conditions or better.

In general, a burned site will be left to recover naturally from wildfire or geologic events. The native habitat types within the preserve are well adapted to recover from wildfires unless the fire frequency is artificially increased. Therefore, burned areas should not be seeded or sprayed with soil stabilizer, straw, or hay. The latter two items are usually contaminated with various problematic weed seeds and often include noxious weed seed. In addition, active post-fire revegetation and soil stabilization efforts interfere with natural post-fire successional species and vegetation development stages that should be allowed to occur for the habitat to properly recover and regenerate.

The preferred erosion control devices to be used, if necessary, include fabric silt fencing, gravel or sand bags (made of biodegradable burlap), straw wattles certified as weed-free (not just free of "U.S. Department of Agriculture noxious weeds," but free of all weeds), and judicious seeding with locally indigenous native species free of weed seed.

The same passive, successional regeneration holds true for mass-movement, landslide, or slope-sloughing types of events. Some plant species have evolved and/or adapted to recruit into these types of geologically disturbed areas.

9.0 LONG-TERM MANAGEMENT PLAN

The primary focus of this Plan is on the successful restoration of comparable Corps-jurisdictional habitat that will be impacted by the Project. The overall management goals of the mitigation program are designed to manage the mitigation sites such that none of the intended functions and values of the sites are lost over time, and so that the presence of native habitats and individual native species are conserved. After completion of the performance-based mitigation requirements during the 5-year maintenance and monitoring program, management of the mitigation areas will transition to long-term management. Long-term management will be conducted in accordance with the RMDP.

9.1 Management and Maintenance Responsibilities

Following successful completion of the mitigation project, the mitigation areas will be managed by an environmental land management entity/organization, such as CNLM, or an approved alternative, as agreed to by Newhall Land and the appropriate resource agencies.

9.1.1 Long-Term Maintenance

Maintenance shall be performed at the direction of the preserve manager. Maintenance shall include performing weed control and management as necessary to maintain the preserves in

compliance with the performance standards. Maintenance shall also include removing accumulated trash and repairing broken or damaged fences, gates, locks, signage, and other preserve-related items on a quarterly basis. In addition, maintenance shall include controlling plant diseases and animal pests determined by the preserve manager.

9.1.2 Long-Term Monitoring

The long-term monitoring methodology for the mitigation sites will focus on the persistence of appropriate functions and values provided by the mitigation program by conducting regular qualitative monitoring visits. Specifically, the items addressed during monitoring visits shall include an evaluation of natural recruitment, presence/absence of plant pests or diseases, erosion and/or drainage conditions on site, presence/absence of non-native or invasive plant species, trash or debris accumulation, wildlife presence/absence, and project fencing/signage.

9.1.3 Reporting

Annual monitoring reports shall be prepared documenting the status of the preserved mitigation areas in accordance with the RMDP. An annual RMDP preserve report will be prepared and submitted each year. As the preserves may be established in phases, the long-term monitoring and reporting may be phased. The annual report will be comprehensive in addressing all the established preserve areas each year. The annual report will contain a description of the revegetation activities, monitoring, maintenance, and adaptive management activities conducted in each of the preserve areas during the calendar year.

9.2 Conservation Mechanism

The mitigation sites for Corps-jurisdictional resources will be preserved within designated preserve areas. Land preservation shall include the River Corridor SMA (includes the Santa Clara River and associated mitigation sites), High Country SMA (includes upper Salt Creek and tributaries of Salt Creek), Salt Creek area (includes lower Salt Creek), and Open Area (includes the tributary canyons). The dedications of these areas are as follows:

River Corridor SMA

- Upon final approval of the Specific Plan, the Special Management Area designation for the River Corridor SMA shall become effective. A permanent, non-revocable conservation and public access easement shall be offered to the County.

- The easement shall be dedicated to the County upon completion of development of all land uses, utilities, roads, flood control improvements, bridges, trails, and other improvements necessary for implementation of the Specific Plan within the River Corridor SMA in each subdivision allowing construction within or adjacent to the River Corridor SMA.
- Prior to the recordation of the River Corridor SMA Conservation and Public Access Easement, the landowner shall provide a plan to the County for the permanent ownership and management of the River Corridor SMA, including any necessary financing.
- The River Corridor SMA shall be transferred to the ownership of CNLM or, if CNLM is declared bankrupt or dissolved, ownership will transfer or revert to a joint powers authority consisting of the County (four members), the City of Santa Clarita (two members), and the Santa Monica Mountains Conservancy (two members).

High Country SMA

- Upon final approval of the Specific Plan, the Special Management Area designation for the High Country SMA shall become effective. A permanent, non-revocable conservation and public access easement shall be offered to the County, and a conservation and management easement offered to the CNLM.
- The High Country SMA shall be offered for dedication in three approximately equal phases of approximately 1,400 acres each, proceeding from north to south as follows: (1) The first offer of dedication will take place with the issuance of the 2,000th residential building permit of Newhall Ranch; (2) the second offer of dedication will take place with the issuance of the 6,000th residential building permit of Newhall Ranch; (3) the remaining offer of dedication will be completed with the issuance of the 11,000th residential building permit of Newhall Ranch; and (4) the Specific Plan applicant shall provide a quarterly report to the Department of Public Works and Regional Planning that indicates the number of residential building permits issued in the Specific Plan area by subdivision map number.
- An appropriate type of service or assessment district shall be formed under the authority of the Los Angeles County Board of Supervisors for the collection of up to $24 per single family detached dwelling unit per year and $15 per single family attached dwelling unit per year, excluding any units designated as Low and Very Low affordable housing units, pursuant to section 3.10, Affordable Housing Program of the Specific Plan (County of Los Angeles 2003). This revenue will be assessed to the homeowner beginning with the occupancy of each dwelling unit and distributed to the joint powers authority for the

purposes of recreation, maintenance, construction, conservation, and related activities within the High Country SMA.

- The High Country SMA shall be offered for dedication in fee to a joint powers authority consisting of the County (four members), the City of Santa Clarita (two members), and the Santa Monica Mountains Conservancy (two members). The joint powers authority will have overall responsibility for recreation within and conservation of the High Country SMA

Salt Creek Area

- The 1,518-acre Salt Creek area shall be offered for dedication to the public pursuant to Condition 42 of the approved Specific Plan (County of Los Angeles 2003) using a "rough-step" land dedication approach.
- Irrevocable offers of dedication will be provided to the appropriate resource agency for identified impact offsets.
- The Salt Creek area will be managed in conjunction with the High Country SMA.

Open Area

- At the time that final subdivision maps permitting construction are recorded, the Open Area within the map will be offered for dedication to a Natural Lands Management Organization (NLMO), such as the CNLM.
- Prior to the offer of dedication of Open Area to an NLMO, all necessary conservation and public access easements, as well as easements for infrastructure, shall be offered to the County.

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APPENDIX A

Vascular Plant Species Observed within the Newhall Ranch Specific Plan Area (2002–2006)

APPENDIX A
Vascular Plant Species Observed within the Newhall Ranch Specific Plan Area (2002–2006)

LYCOPODIAE

SELAGINELLACEAE – SPIKE-MOSS FAMILY

Selaginella bigelovii – Bigelow's spike-moss

EQUISETAE

EQUISETACEAE – HORSETAIL FAMILY

Equisetum hyemale – common scouring-rush
Equisetum laevigatum – smooth scouring-rush
Equisetum telmateia – giant horsetail

FILACEAE

AZOLLACEAE – MOSQUITO FERN FAMILY

Azolla c.f. *filiculoides* – duckweed fern

DENNSTAEDTIACEAE – BRACKEN FAMILY

Adiantum jordanii – California maiden-hair
Pellaea andromedifolia – coffee fern
Pellaea mucronata var. *mucronata* – bird's-foot fern
Pentagramma triangularis – goldenback fern

DRYOPTERIDACEAE – WOOD FERN FAMILY

Dryopteris arguta – coastal wood fern

POLYPODIACEAE – POLYPODY FAMILY

Polypodium californicum – California polypody

CONIFERAE

CUPRESSACEAE – CYPRESS FAMILY

* *Cedrus deodara* – deodar cedar
Juniperus californica – California juniper

PINACEAE – PINE FAMILY

* *Pinus halepensis* – Aleppo pine
* *Pinus pinea* – stone pine

ANGIOSPERMAE (DICOTYLEDONES)

AIZOACEAE – FIG-MARIGOLD FAMILY

* *Aptenia cordifolia* – baby sun-rose
* *Carpobrotus* sp. – sea-fig

AMARANTHACEAE – AMARANTH FAMILY

* *Amaranthus albus* – tumbleweed
Amaranthus blitoides – prostrate amaranth
* *Amaranthus hybridus* – amaranth
Amaranthus palmeri – Palmer's amaranth
Amaranthus powellii – Powell's amaranth
* *Amaranthus retroflexus* – rough pigweed

ANACARDIACEAE – SUMAC FAMILY

Malosma laurina – laurel sumac
Rhus ovata – sugar-bush
Rhus trilobata – squaw bush
* *Schinus molle* – Peruvian pepper-tree
Toxicodendron diversilobum – poison-oak

APIACEAE – CARROT FAMILY

* *Anethum graveolens* – dill
Apiastrum angustifolium – wild celery
* *Apium graveolens* – celery
Berula erecta – cutleaf water-parsnip
Bowlesia incana – American bowlesia
* *Conium maculatum* – poison hemlock
* *Coriandrum sativum* – cilantro
* *Daucus carota* – Queen Anne's lace
Daucus pusillus – rattlesnake weed
Lomatium utriculatum – common lomatium
Lomatium caruifolium – alkali parsnip
Sanicula bipinnata – poison sanicle
Osmorhiza brachypoda – California sweet-cicely
* *Petroselinum crispum* – parsley
Sanicula crassicaulis – Pacific sanicle
* *Torilis arvensis* – Japanese hedge-parsley
* *Torilis nodosa* – knot hedge-parsley
Yabea microcarpa – California hedge parsley

APOCYNACEAE – DOGBANE FAMILY

Apocynum cannabinum – Indian hemp
* *Vinca major* – periwinkle

ASCLEPIADACEAE – MILKWEED FAMILY

Asclepias californica – California milkweed
Asclepias fascicularis – narrow-leaf milkweed

ASTERACEAE – SUNFLOWER FAMILY

Achillea millefolium – yarrow
Achyrachaena mollis – blow-wives
Acourtia microcephala – sacapellote
Agoseris grandiflora – large-flowered agoseris
Agoseris retrorsa – spear-leaf agoseris
Ambrosia acanthicarpa – annual burweed
Ambrosia confertifolia – weak-leaved burweed
Ambrosia psilostachya – western ragweed
Artemisia californica – coastal sagebrush
Artemisia douglasiana – California mugwort
Artemisia dracunculus – tarragon
Artemisia tridentata – Great Basin sagebrush
Baccharis douglasii – marsh baccharis
Baccharis emoryi – Emory's baccharis
Baccharis pilularis – coyote brush
Baccharis salicifolia – mulefat
Baccharis sarothroides – chaparral broom
Brickellia californica – California brickellbush
Brickellia nevinii – Nevin's brickellbush
* *Carduus pycnocephalus* – Italian thistle
* *Centaurea melitensis* – star thistle
Chaenactis artemisiifolia – artemisia pincushion
Chaenactis glabriuscula – yellow pincushion
Chrysothamnus nauseosus – rubber rabbitbrush
Cirsium occidentale var. *californicum* – California thistle
Cirsium occidentale var. *occidentale* – cobwebby thistle
* *Cirsium vulgare* – bull thistle
* *Cnicus benedictus* – blessed thistle
Conyza canadensis – horseweed
Conyza coulteri – Coulter's conyza

Coreopsis bigelovii – Bigelow's coreopsis
* *Coreopsis tinctoria* – calliopsis
Corethrogyne filaginifolia – virgate cudweed aster
* *Cotula coronopifolia* – African brass-buttons
* *Cotula australis* – Australian brass-buttons
Deinandra increscens ssp. *increscens* – no common name
Encelia actoni – Acton's encelia
Encelia californica – California bush sunflower
Encelia farinosa – brittlebush, incensio
Ericameria palmeri var. *pachylepis* – goldenbush
Ericameria pinifolia – pine-bush
Erigeron foliosus – leafy daisy
Eriophyllum confertiflorum – long-stem golden yarrow
Euthamia occidentalis – western goldenrod
Filago californica – California fluffweed
* *Filago gallica* – narrow-leaf filago
* *Gazania linearis* – gazania
Gnaphalium bicolor – bicolor cudweed
Gnaphalium californicum – California everlasting
Gnaphalium canescens ssp. *microcephalum* – white everlasting
Gnaphalium leucocephalum – Sonora everlasting
Gnaphalium luteo-album – white cudweed
Gnaphalium sp. *nova* – everlasting
Gnaphalium palustre – lowland cudweed
Gnaphalium stramineum – cotton-batting plant
Grindelia sp. – gumplant
Hazardia squarrosa ssp. *grindelioides* – saw-toothed goldenbush
Helianthus annuus – common sunflower
Helianthus sp. nova – undescribed sunflower
Hemizonia fasciculata – fascicled tarweed
Hemizonia kelloggii – Kellogg's tarweed
Heterotheca grandiflora – telegraph weed
Heterotheca sessiliflora – golden aster
Hypochaeris glabrata – smooth cat's ear
* *Hypochaeris radicata* – hairy cat's ear
Isocoma menziesii – goldenbush
Isocoma menziesii var. *menziesii* [*Haplopappus venetus*] – Menzies' goldenbush
Iva axillaris – poverty weed
* *Lactuca saligna* – willowleaf lettuce

* *Lactuca serriola* – prickly lettuce
Lagophylla ramosissima – common hareleaf
Lasthenia californica – coast goldfields
Layia glandulosa – white layia
Layia platyglossa – tidy tips
Lepidospartum squamatum – scale-broom
Lessingia filaginifolia – California aster
Lessingia glandulifera – lessingia
Madia exigua – small tarweed
Madia gracilis – slender madia
Malacothrix clevelandii – Cleveland's malacothrix
Malacothrix saxatilis – cliff malacothrix
* *Matricaria matricarioides* – pineapple weed
Micropus californicus – slender cottonweed
* *Picris echioides* – bristly ox-tongue
Pluchea odorata – marsh-fleabane
Pluchea sericea – arrow weed
Psilocarphus tenellus – slender woolly-heads
* *Pulicaria paludosa* – Spanish sunflower
Rafinesquia californica – California chicory
Senecio californicus – California butterweed
Senecio flaccidus var. *douglasii* – butterweed
* *Senecio vulgaris* – common groundsel
Silybum marianum – milk thistle
Solidago californica – California goldenrod
* *Sonchus asper* – prickly sow-thistle
* *Sonchus oleraceus* – common sow-thistle
* *Spartium junceum* – Spanish broom
Stebbinsoseris heterocarpa [*Microseris heterocarpa*] – brown puffs
Stephanomeria cichoriacea – chicory-leaved Stephanomeria
Stephanomeria exigua – small wreath plant
Stephanomeria pauciflora – wire-lettuce
Stephanomeria virgata – twiggy wreath plant
Stylocline gnaphaloides – everlasting nest-straw
Uropappus lindleyi [*Microseris lindleyi*] – silver puffs
Wyethia ovata – mule ears
Xanthium spinosum – spiny cocklebur
Xanthium strumarium – cocklebur

BETULACEAE – BIRCH FAMILY

Alnus rhombifolia – white alder

BORAGINACEAE – BORAGE FAMILY

Amsinckia menziesii var. *intermedia* – yellow fiddleneck
Amsinckia menziesii var. *menziesii* – yellow fiddleneck
Amsinckia tessellata – devil's lettuce
Cryptantha sp. – forget-me-not
Cryptantha decipiens – gravel cryptantha
Cryptantha intermedia – common forget-me-not
Cryptantha micrantha – redroot cryptantha
Cryptantha microstachys – Tejon cryptantha
Cryptantha muricata – prickly cryptantha
Heliotropium curassavicum – wild heliotrope
Pectocarya linearis – slender pectocarya
Pectocarya penicillata – pectocarya
Pectocarya setosa – pectocarya
Plagiobothrys arizonicus – popcorn flower
Plagiobothrys canescens – rusty popcorn flower
Plagiobothrys collinus – California popcorn flower
Plagiobothrys fulvus – common popcorn flower

BRASSICACEAE – MUSTARD FAMILY

Arabis sparsiflora – no common name
Athysanus pusillus – dwarf athysanus
* *Brassica nigra* – black mustard
* *Capsella bursa-pastoris* – shepherd's purse
Caulanthus lasiophyllus – California mustard
Descurainia pinnata ssp. *halictorum* – tansy mustard
Erysimum capitatum – wall flower
* *Hirschfeldia incana* – short-podded mustard
Lepidium lasiocarpum – peppergrass
* *Lepidium latifolium* – peppergrass
Lepidium oblongum – peppergrass
Lepidium virginicum – wild peppergrass
* *Lobularia maritime* – sweet-alyssum
* *Raphanus sativus* – wild radish
* *Rorippa nasturtium-aquaticum* – water cress
* *Sisymbrium altissimum* – tumble mustard

* *Sisymbrium irio* – London rocket
* *Sisymbrium officinale* – hedge mustard
* *Sisymbrium orientale* – oriental mustard
Stanleya pinnata var. *pinnata* – Prince's plume
Thysanocarpus curvipes – fringepod
Thysanocarpus laciniatus – lacepod
Tropidocarpum gracile – slender dobie-pod

CACTACEAE – CACTUS FAMILY
* *Cereus peruvianus* – Peruvian apple cactus
Opuntia basilaris var. *ramosa* – beaver-tail cactus
Opuntia californica var. *parkeri* – cane cholla
Opuntia littoralis – coastal prickly-pear
Opuntia × *vaseyi* – prickly-pear cactus
* *Trichocereus spachianus* – golden torch cactus

CAMPANULACEAE – BELLFLOWER FAMILY
Nemacladus ramosissimus – Nuttall's threadplant

CAPPARACEAE – CAPER FAMILY
Isomeris arborea – bladderpod

CAPRIFOLIACEAE – HONEYSUCKLE FAMILY
Lonicera interrupta – chaparral honeysuckle
Lonicera subspicata – southern honeysuckle
Sambucus mexicana – Mexican elderberry
Symphoricarpos sp. – snowberry
Symphoricarpos c.f. *mollis* – spreading snowberry

CARYOPHYLLACEAE – PINK FAMILY
* *Cerastium glomeratum* – sticky mouse-ear
* *Herniaria hirsuta* ssp. *cinerea* – gray herniaria
Loeflingia squarrosa – no common name
* *Silene gallica* – common catchfly
Spergularia sp. – stickwort, starwort
* *Spergularia rubra* – sand-spurrey
* *Spergularia* c.f. *villosa* – villous sand-spurrey
* *Stellaria media* – common chickweed
Stellaria nitens – shining chickweed

CASUARINACEAE – SHEET OAK FAMILY

* *Casuarina cunninghamiana* – Australian pine

CHENOPODIACEAE – GOOSEFOOT FAMILY

Atriplex canescens – four-winged saltbush
* *Atriplex heterosperma* – weedy orache
Atriplex lentiformis – big saltbush, quail brush
* *Atriplex rosea* – tumbling oracle
* *Atriplex semibaccata* – Australian saltbush
Atriplex serenana var. *serenana* – bractscale
Atriplex suberecta – Australian saltbush
Atriplex triangularis – spearscale
* *Bassia hyssopifolia* – five-hooked bassia
* *Beta vulgaris* – garden beet
* *Chenopodium album* – lamb's-quarters
* *Chenopodium ambrosioides* – Mexican tea
Chenopodium berlandieri – pitseed goosefoot
* *Chenopodium botrys* – goosefoot
Chenopodium californicum – California goosefoot
* *Chenopodium murale* – nettle-leaved goosefoot
Chenopodium rubrum – red goosefoot
* *Salsola tragus* – Russian-thistle
* *Spinacia oleracea* – spinach

CONVOLVULACEAE – MORNING-GLORY FAMILY

Calystegia macrostegia ssp. *cyclostegia* – morning-glory
Calystegia peirsonii – Peirson's morning-glory
* *Convolvulus arvensis* – bindweed

CRASSULACEAE – STONECROP FAMILY

Crassula connata – dwarf stonecrop
Dudleya cymosa – unidentified dudleya
Dudleya lanceolata – lanceleaf dudleya

CUCURBITACEAE – GOURD FAMILY

Cucurbita foetidissima – coyote-melon, calabazilla
Marah fabaceus – California manroot
Marah macrocarpus – wild cucumber

CUSCUTACEAE – DODDER FAMILY

Cuscuta californica – California dodder
Cuscuta pentagona – five-angled dodder
Cuscuta subinclusa – canyon dodder

DATISCACEAE – DATISCA FAMILY

Datisca glomerata – Durango root

ERICACEAE – HEATH FAMILY

Arctostaphylos glandulosa ssp. *mollis* – manzanita
Arctostaphylos glauca – bigberry manzanita

EUPHORBIACEAE – SPURGE FAMILY

Chamaesyce albomarginata – rattlesnake spurge
* *Chamaesyce maculata* – spotted spurge
Chamaesyce polycarpa – small-seed sand mat
Chamaesyce serpyllifolia – thyme-leafed spurge
Croton californicus – California croton
Eremocarpus setigerus – doveweed
Euphorbia spathulata – reticulate-seed spurge
* *Ricinus communis* – castor-bean
Stillingia linearifolia – linear-leaved stillingia

FABACEAE – PEA FAMILY

Amorpha californica var. *californica* – false indigo
* *Acacia baileyana* – golden wattle
Astragalus didymocarpus – white dwarf locoweed
Astragalus gambelianus – Gambel's locoweed
Astragalus trichopodus – Santa Barbara locoweed
Glycyrrhiza lepidota – wild licorice
Lathyrus laetiflorus – wild sweet pea
Lathyrus vestitus – wild pea
Lotus corniculatus – bird's-foot lotus
Lotus hamatus – grab lotus
Lotus humistratus – lotus
Lotus purshianus – Spanish-clover
Lotus salsuginosus – coastal lotus
Lotus scoparius var. *scoparius* – deerweed
Lotus strigosus – strigose deerweed
Lupinus bicolor – Lindley's annual lupine

Lupinus excubitus – Mountain Springs bush lupine
Lupinus excubitus var. *excubitus* – grape soda lupine
Lupinus excubitus var. *hallii* – grape soda lupine
Lupinus hirsutissimus – stinging lupine
Lupinus microcarpus var. *densiflorus* – chick lupine
Lupinus microcarpus var. *microcarpus* – chick lupine
Lupinus sparsiflorus – Coulter's lupine
Lupinus succulentus – arroyo lupine
Lupinus truncatus – collar lupine
* *Medicago polymorpha* – California burclover
* *Medicago polymorpha* var. *brevispina* – short-spined California burclover
* *Medicago sativa* – alfalfa
* *Melilotus alba* – white sweet-clover
* *Melilotus indica* – yellow sweet-clover
* *Robinia pseudoacacia* – black locust
Trifolium sp. – clover
Trifolium albopurpureum – rancheria clover
Trifolium ciliolatum – tree clover
* *Trifolium fragiferum* – strawberry clover
Trifolium fucatum – bull clover
Trifolium gracilentum – pin-point clover
* *Trifolium hirtum* – rose clover
Trifolium microcephalum – maiden clover
* *Trifolium repens* – white clover
Trifolium willdenovii – valley clover
Vicia americana – American vetch
Vicia exigua – slender vetch
Vicia hassei – Hesse's vetch
* *Vicia villosa* ssp. *villosa* – winter vetch

FAGACEAE – BEECH FAMILY

Quercus agrifolia – coast live oak
Quercus berberidifolia – scrub oak
Quercus chrysolepis – canyon live oak
Quercus douglasii × *Q. lobata* – oak
Quercus douglasii – blue oak
Quercus lobata – valley oak

GERANIACEAE – GERANIUM FAMILY

* *Erodium brachycarpum* – shortfruit stork's bill
* *Erodium botrys* – long-beaked filaree
* *Erodium cicutarium* – red-stemmed filaree
* *Erodium moschatum* – white-stemmed filaree

GROSSULARIACEAE – CURRANT FAMILY

Ribes aureum – golden currant
Ribes californicum – California gooseberry
Ribes malvaceum – chaparral currant

HYDROPHYLLACEAE – WATERLEAF FAMILY

Emmenanthe penduliflora – whispering bells
Eriodictyon crassifolium var. *nigrescens* – yerba santa
Eucrypta chrysanthemifolia – common eucrypta
Nemophila menziesii – baby blue-eyes
Nemophila parviflora var. *quercifolia* – oak-leaved nemophila
Nemophila pedunculata – littlefoot nemophila
Phacelia cicutaria – caterpillar phacelia
Phacelia cicutaria var. *hispida* – caterpillar phacelia
Phacelia cicutaria var. *hubbyi* – caterpillar scorpionweed
Phacelia distans – blue fiddleneck
Phacelia imbricata ssp. *imbricata* – imbricate phacelia
Phacelia minor – wild Canterbury-bell
Phacelia ramosissima – shrubby phacelia
Phacelia viscida – sticky phacelia
Pholistoma auritum – fiesta flower

JUGLANDACEAE – WALNUT FAMILY

Juglans californica – Southern California black walnut

LAMIACEAE – MINT FAMILY

* *Lamium amplexicaule* – henbit
* *Marrubium vulgare* – horehound
Mentha citrata – orange mint
Monardella lanceolata – mustang mint
Salvia apiana – white sage
Salvia × *bernardina* – no common name
Salvia columbariae – chia
Salvia leucophylla – purple sage

Salvia mellifera – black sage
Scutellaria tuberosa – Danny's skullcap
Stachys ajugoides – bugle hedge-nettle
Stachys ajugoides var. *rigida* – rigid hedge-nettle
Stachys albens – white hedge-nettle
Trichostema lanatum – woolly bluecurls
Trichostema lanceolatum – vinegar weed

LAURACEAE – LAUREL FAMILY
Umbellularia californica – California laurel

LOASACEAE – STICK-LEAF FAMILY
Mentzelia sp. – blazing star
Mentzelia laevicaulis – blazing star
Mentzelia micrantha – small-flowered stick-leaf

LYTHRACEAE – LOOSESTRIFE FAMILY
Lythrum californicum – California loosestrife

MALVACEAE – MALLOW FAMILY
Malacothamnus fasciculatus ssp. *laxiflorus* – chaparral bush mallow
Malacothamnus fremontii – bush mallow
Malacothamnus marrubioides – bush mallow
* *Malva neglecta* – common mallow
* *Malva parviflora* – cheeseweed

MELIACEAE – MAHOGANY FAMILY
* *Melia azedarach* – Chinaberry

MORACEAE – FIG FAMILY
* *Ficus carica* – edible fig

MYRTACEAE – MYRTLE FAMILY
* *Eucalyptus* sp. – eucalyptus
* *Eucalyptus camaldulensis* – red gum
* *Eucalyptus globulus* – blue gum
* *Eucalyptus leucoxylon* – white ironbark
* *Eucalyptus polyanthemos* – silver dollar gum
* *Eucalyptus sideroxylon* – red ironbark

NYCTAGINACEAE – FOUR O'CLOCK FAMILY

Mirabilis laevis var. *crassifolia* [*M. californica*] – California wishbone-bush

OLEACEAE – OLIVE FAMILY

Fraxinus dipetala – California ash
* *Fraxinus uhdei* – tropical ash
Fraxinus velutina – velvet ash
* *Ligustrum lucidum* – glossy privet
* *Olea europaea* – mission olive

ONAGRACEAE – EVENING-PRIMROSE FAMILY

Camissonia bistorta – southern sun cup
Camissonia bistorta × *hirtella* – sun cup
Camissonia boothii – sun cup
Camissonia boothii ssp. *decorticans* – shredding evening primrose
Camissonia californica – mustard primrose
Camissonia hirtella – sun cup
Camissonia micrantha – miniature sun cup
Camissonia strigulosa – sun cup
Clarkia cylindrical – speckled clarkia
Clarkia purpurea – winecup clarkia
Clarkia speciosa – clarkia
Clarkia unguiculata – elegant clarkia
Epilobium brachycarpum – willow herb
Epilobium canum ssp. *canum* – California fuchsia
Epilobium ciliatum – California cottonweed
Ludwigia peploides – yellow waterweed
Ludwigia repens – water primrose
Oenothera elata – evening primrose
* *Oenothera laciniata* – evening primrose

OROBANCHACEAE – BROOM-RAPE FAMILY

Orobanche fasciculata – clustered broom-rape
Orobanche parishii ssp. *parishii* – broom-rape
Orobanche sp. – broom-rape

PAEONIACEAE – PEONY FAMILY

Paeonia californica – California peony

PAPAVERACEAE – POPPY FAMILY

Argemone corymbosa – prickly poppy
Dendromecon rigida – tree poppy
Dicentra chrysantha – golden ear-drops
Dicentra ochroleuca – yellow bleeding heart
Eschscholzia californica – California poppy
Meconella denticulata – small-flower meconella
Papaver californicum – fire poppy
Platystemon californicus – California creamcups

PLANTAGINACEAE – PLANTAIN FAMILY

Plantago erecta – dot-seed plantain
* *Plantago indica* – plantain
* *Plantago lanceolata* – English plantain
* *Plantago major* – common plantain
Plantago c.f. *ovata* – woolly plantain

PLATANACEAE – SYCAMORE FAMILY

Platanus racemosa – western sycamore

POLEMONIACEAE – PHLOX FAMILY

Allophyllum divaricatum – purple false gillyflower
Allophyllum glutinosum – sticky false gillyflower
Eriastrum densifolium – woollystar
Eriastrum densifolium ssp. *densifolium* – woollystar
Eriastrum densifolium ssp. *elongatum* – elongate eriastrum
Eriastrum densifolium ssp. *mohavense* – Mohave eriastrum
Eriastrum sapphirinum – sapphire eriastrum
Gilia angelensis – angel gilia
Gilia capitata – globe gilia
Gilia splendens – splendid gilia
Leptodactylon californicum – prickly phlox
Linanthus androsaceus – common linanthus
Linanthus pygmaeus – linanthus
Navarretia atractyloides – holly-leaf skunkweed
Phlox gracilis – slender phlox

POLYGONACEAE – BUCKWHEAT FAMILY

Chorizanthe fimbriata – fringed spineflower
Chorizanthe parryi var. *fernandina* – San Fernando Valley spineflower

Chorizanthe staticoides – Turkish rugging
Eriogonum angulosum – angle-stem buckwheat
Eriogonum baileyi – Bailey's buckwheat
Eriogonum brachyanthum – short-flowered buckwheat
Eriogonum elongatum – long-stemmed buckwheat
Eriogonum fasciculatum ssp. *foliolosum* – California buckwheat
Eriogonum fasciculatum ssp. *polifolium* – California buckwheat
Eriogonum gracile var. *gracile* – slender woolly buckwheat
Eriogonum gracillimum – rose and white buckwheat
Eriogonum maculatum – spotted buckwheat
Eriogonum nudum – naked buckwheat
Eriogonum c.f. *viridescens* – buckwheat
Lastarriaea coriacea – lastarriaea
* *Polygonum arenastrum* – common knotweed
* *Polygonum argyrocoleon* – smartweed
Polygonum lapathifolium – willow weed
Polygonum punctatum – perennial smartweed
Pterostegia drymarioides – granny's hairnet
* *Rumex conglomeratus* – whorled dock
* *Rumex crispus* – curly dock
Rumex hymenosepalus – wild rhubarb
Rumex maritimus – golden dock
Rumex obtusifolius – dock
Rumex salicifolius – willow dock

PORTULACACEAE – PURSLANE FAMILY

Calandrinia ciliata – redmaids
Calyptridium sp. – pussypaws
Claytonia parviflora – small-leaved montia
Claytonia perfoliata – miner's lettuce
* *Portulaca oleracea* – common purslane

PRIMULACEAE – PRIMROSE FAMILY

* *Anagallis arvensis* – scarlet pimpernel

RANUNCULACEAE – BUTTERCUP FAMILY

Clematis ligusticifolia – yerba de chiva
Clematis pauciflora – ropevine
Delphinium cardinale – scarlet larkspur
Delphinium parryi ssp. *parryi* – Parry's larkspur

RHAMNACEAE – BUCKTHORN FAMILY

Ceanothus crassifolius – hoary-leaved ceanothus
Ceanothus foliosus – southern blue lilac
Ceanothus leucodermis – white-bark ceanothus
Ceanothus tomentosus – woolyleaf ceanothus
Rhamnus crocea – redberry
Rhamnus ilicifolia – holly-leaf redberry

ROSACEAE – ROSE FAMILY

Adenostoma fasciculatum – chamise
Cercocarpus betuloides – mountain-mahogany
Cercocarpus betuloides var. *betuloides* – birch-leaf mountain-mahogany
Cercocarpus betuloides var. *blancheae* – island mountain-mahogany
Heteromeles arbutifolia – toyon
Prunus ilicifolia – holly-leaf cherry
Prunus virginiana var. *demissa* – western choke-cherry
Rosa californica – California rose
Rubus ursinus – California blackberry
* *Sanguisorba minor* – garden burnet

RUBIACEAE – MADDER FAMILY

Galium angustifolium – narrow-leaved bedstraw
* *Galium aparine* – goose grass
Galium nuttallii ssp. *nuttallii* – San Diego bedstraw
Galium porrigens – climbing bedstraw

SALICACEAE – WILLOW FAMILY

Populus fremontii – Fremont cottonwood
Populus tremuloides – quaking aspen
Salix exigua – narrow-leaved willow
Salix gooddingii – black willow
Salix laevigata – red willow
Salix lasiolepis – arroyo willow
Salix lucida ssp. *lasiandra* – golden willow

SAURURACEAE – LIZARD'S-TAIL FAMILY

Anemopsis californica – yerba mansa

SAXIFRAGACEAE – SAXIFRAGE FAMILY

Lithophragma bolanderi – Bolander's woodland star
Saxifraga californica – California saxifrage

SCROPHULARIACEAE – FIGWORT FAMILY

Antirrhinum coulterianum – white snapdragon
Antirrhinum multiflorum – withered snapdragon
Castilleja affinis – coast paintbrush
Castilleja densiflora – dense-flowered owl's-clover
Castilleja exserta – common owl's-clover
Castilleja foliolosa – woolly Indian paintbrush
Collinsia heterophylla – purple Chinese houses
Collinsia parviflora – maiden blue eyed Mary
Cordylanthus rigidus – bird's beak
Keckiella cordifolia – heart-leaf penstemon
Linaria canadensis – toadflax
Mimulus aurantiacus – bush monkeyflower
Mimulus aurantiacus var. *pubescens* – bush monkeyflower
Mimulus brevipes – yellow monkeyflower
Mimulus guttatus – seep monkeyflower
Mimulus pilosus – downy monkeyflower
Penstemon centranthifolius – scarlet bugler
Scrophularia californica – California figwort
* *Verbascum thapsus* – woolly mullein
* *Verbascum virgatum* – wand mullein
* *Veronica anagallis-aquatica* – water speedwell
* *Veronica persica* – Persian speedwell

SIMAROUBACEAE – QUASSIA FAMILY

* *Ailanthus altissima* – tree of heaven

SOLANACEAE – NIGHTSHADE FAMILY

Datura wrightii – western jimsonweed
* *Nicotiana glauca* – tree tobacco
Nicotiana quadrivalvis – Indian tobacco
* *Solanum americanum* – small-flowered nightshade
Solanum douglasii – white nightshade
* *Solanum elaeagnifolium* – silver leaf horse-nettle
* *Solanum sarrachoides* – hairy nightshade
Solanum xanti – chaparral nightshade

TAMARICACEAE – TAMARISK FAMILY

* *Tamarix* sp. – tamarisk

* *Tamarix ramosissima* – tamarisk

ULMACEAE – ELM FAMILY

* *Ulmus pumila* – Siberian elm

URTICACEAE – NETTLE FAMILY

Hesperocnide tenella – western nettle

Parietaria hespera – western pellitory

Urtica dioica – giant creek nettle

* *Urtica urens* – dwarf nettle

VERBENACEAE – VERVAIN FAMILY

Verbena lasiostachys – western verbena

VIOLACEAE – VIOLET FAMILY

Viola pedunculata – Johnny jump-ups

VISCACEAE – MISTLETOE FAMILY

Phoradendron macrophyllum – big leaf mistletoe

Phoradendron villosum – oak mistletoe

VITACEAE – GRAPE FAMILY

Parthenocissus vitacea – woodbine, Virginia creeper

Vitis girdiana – desert wild grape

ZYGOPHYLLACEAE – CALTROP FAMILY

* *Tribulus terrestris* – puncture vine

ANGIOSPERMAE (MONOCOTYLEDONES)

ARECACEAE – PALM FAMILY

* *Washingtonia robusta* – Mexican fan palm

CYPERACEAE – SEDGE FAMILY

Carex alma – sturdy sedge

Carex praegracilis – clustered field sedge

Carex sp. – sedge

Cyperus eragrostis – tall cyperus

Cyperus esculentus – yellow nut-grass

* *Cyperus involucratus* – nutsedge
Cyperus odoratus – coarse cyperus
Eleocharis montevidensis – slender creeping spike-rush
Eleocharis parishii – Parish's spikerush
Eleocharis rostellata – beaked spikerush
Scirpus acutus – hard-stemmed bulrush
Scirpus americanus – winged three-square
Scirpus maritimus – alkali bulrush
Scirpus microcarpus – bulrush
Scirpus robustus – Pacific coast bulrush

IRIDACEAE – IRIS FAMILY
Sisyrinchium bellum – blue-eyed grass

JUNCACEAE – RUSH FAMILY
Juncus sp. – rush
Juncus acutus ssp. *leopoldii* – southwestern spiny rush
Juncus balticus – wire rush
Juncus bufonius – toad rush
Juncus longistylis – rush
Juncus mexicanus – Mexican rush
Juncus rugulosus – wrinkled rush
Juncus textilis – Indian rush
Juncus torreyi – rush
Juncus triformis – Yosemite dwarf rush
Juncus xiphioides – iris-leaved rush

LEMNACEAE – DUCKWEED FAMILY
Lemna minuscula – duckweed
Lemna valdiviana – duckweed

LILIACEAE – LILY FAMILY
* *Allium cepa* – onion
Allium porrum – leek
* *Amaryllis belladonna* – naked lady
* *Asparagus officinalis* – asparagus
Bloomeria crocea – common goldenstar
Brodiaea terrestris ssp. *kernensis* – dwarf brodiaea
Calochortus clavatus var. *gracilis* – slender mariposa lily
Calochortus venustus – mariposa lily

Calochortus weedii var. *vestus* – late-flowered mariposa lily
Chlorogalum pomeridianum – soap plant
Dichelostemma capitatum – blue dicks
Muilla maritima – common muilla
Yucca whipplei – Our Lord's candle
Yucca schidigera – Mojave yucca

POACEAE – GRASS FAMILY

Achnatherum coronatum – giant needlegrass
* *Agrostis* sp. – bentgrass
* *Agrostis viridis* – water bent
Aristida adscensionis – six-weeks three-awn
* *Arundo donax* – giant reed
* *Avena barbata* – slender oat
* *Avena fatua* – wild oat
Avena sativa – cultivated oat
* *Bromus arenarius* – Australian brome
Bromus carinatus – California brome
Bromus catharticus – California brome
Bromus catharticus var. *catharticus* – California brome
* *Bromus diandrus* – ripgut grass
Bromus grandis – tall brome
* *Bromus hordeaceus* – soft chess
* *Bromus madritensis* ssp. *rubens* – foxtail chess
* *Bromus sterilis* – sterile brome
* *Bromus tectorum* – cheat grass
* *Cortaderia selloana* – pampas grass
* *Crypsis schoenoides* – prickle grass
* *Cynodon dactylon* – Bermuda grass
* *Digitaria sanguinalis* – hairy crabgrass
Distichlis spicata – salt grass
* *Echinochloa colonum* – jungle-rice
Echinochloa crus-galli – barnyard grass
* *Eleusine indica* – goose grass
Elymus elymoides – bottlebrush squirreltail
Elymus glaucus – western wild-rye
Elymus multisetus – big squirreltail
Eragrostis mexicana – lovegrass
* *Festuca arundinacea* – tall fescue

* *Hordeum marinum* – Mediterranean barley
* *Hordeum murinum* – glaucous foxtail barley
Koeleria macrantha – Junegrass
* *Lamarckia aurea* – goldentop
* *Leptochloa uninervia* – Mexican sprangletop
Leymus condensatus – giant ryegrass
Leymus triticoides – beardless wild rye
* *Lolium multiflorum* – Italian ryegrass
* *Lolium perenne* – perennial ryegrass
* *Lolium temulentum* – darnel
Melica imperfecta – California melic
Muhlenbergia asperifolia – scratch-grass
Muhlenbergia microsperma – littleseed muhly
Nassella cernua – nodding needlegrass
Nassella lepida – foothill needlegrass
Nassella pulchra – purple needlegrass
Panicum capillare – western witchgrass
* *Panicum miliaceum* – broom corn millet
* *Parapholis incurva* – sickle grass
Paspalum distichum – knotgrass
* *Phalaris aquatica* – Harding grass
* *Phalaris minor* – Mediterranean canary grass
* *Piptatherum miliaceum* – smilo grass
* *Poa annua* – annual bluegrass
Poa secunda – Malpais bluegrass
* *Polypogon interruptus* – ditch beard grass
* *Polypogon monspeliensis* – rabbit's-foot grass
Schismus barbatus – abumashi
Sorghum bicolor – sorghum
Sorghum halepense – Johnsongrass
Sporobolus airoides – alkali sacation
* *Triticum aestivum* – cultivated wheat
Vulpia microstachys – fescue
* *Vulpia myuros* – rattail fescue
Vulpia octoflora – six-weeks fescue

POTAMOGETONACEAE – PONDWEED FAMILY
Potamogeton foliosus – leafy pondweed

TYPHACEAE – CATTAIL FAMILY

Typha angustifolia – narrow leaved cattail
Typha domingensis – slender cattail
Typha latifolia – broad-leaved cattail

* signifies introduced (non-native) species

APPENDIX B

Hybrid Assessment of Riparian Condition (HARC) Methodology

Date _____

Surveyor Initials _____

Newhall Site _____

Stream Reach Number _____

Assessment Area (AA) Number _____

Buffer Metrics (CRAM and LLFA)

1. *(office, verify in field)* Average Width of Buffer	
> 100 m	1.0
60 - 100 m	0.75
30 - 60 m	0.50
<30 m	0.10
None	0.0

2. *(office, verify in field)* Buffer Condition	
Area is characterized by natural, undisturbed upland with native vegetation and lack of invasive plants, lack of substrate disturbance, and lack of trash.	1.0
Buffer appears to have been moderately disturbed and may be characterized by presence of invasive plants, etc., (minor to moderate amounts of trash or debris visible); abandoned field; shrubland or buffer recently burned, but recoverable; dirt road crossing; or mowed, non-native ruderal.	0.75
Disced ruderal; dry-land farming; active agriculture.	0.50
Dirt road, not recoverable; residential; pastureland; landscaped park.	0.25
Buffer is highly disturbed, barren ground visible with highly compacted soils, moderate to high amounts of trash and other large debris; urban or industrial.	0.10
No buffer present.	0.0

3. *(office, includes sub-watershed outside AA)* Land Use/Land Cover	
<5% of watershed/landscape with LULC types that increase N/P/H/S.	1.0
>5 and <15% of watershed/landscape with LULC types that increase N/P/H/S; or recently burned open space.	0.75
>15 and <30% of watershed/landscape with LULC types that increase N/P/H/S.	0.50
>30 and <50% of watershed/landscape with LULC types that N/P/H/S.	0.25
>50% of watershed/landscape with LULC types that increase N/P/H/S.	0.10

Hydrology Metrics (CRAM, LLFA, HGM)

4. *(office, includes sub-watershed outside AA)* Water Source	
Water source derived from precipitation, groundwater and/or natural overland or tributary flow from catchments. No indications of artificial water sources.	1.0
Source of water is primarily natural; however, may receive occasional or small amounts of inflow from anthropogenic sources, such as urban runoff, seepage, agriculture or POTW discharge. Natural flow regime.	0.75
Source of water is primarily anthropogenic, and receives inflow from anthropogenic sources, such as urban runoff, seepage, agriculture or POTW discharge. Non-natural flow regime.	0.50
Primarily supported by direct irrigation, pumped water, artificially impounded water, or other artificial hydrology; may be perennial flow; channel incision present.	0.25
No natural or non-natural flows occur at the present time.	0.0

Date _____

Surveyor Initials _____

Newhall Site_____

Stream Reach Number_____

Assessment Area (AA) Number_____

5. *(office, verify in field)* Hydroperiod	
Subject to natural peak flows and base flow.	1.0
Peak flow relatively natural, but base flows altered either by augmentation or reduction; or Reach has recently burned, but is recoverable; temporary peak flows are anticipated.	0.75
Peak flows altered by upstream activities (augmentation or reduction), but base flows are relatively natural.	0.50
Assessment area is subject to alteration of both peak flow and base flow. Recoverable.	0.25
Assessment area is subject to alteration of both peak flow and base flow. Not recoverable.	0.10
6. *(field)* Floodplain Connection	
Adjacent to an unrestricted floodplain that is comprised of natural or open space lands or agricultural lands.	1.0
In most years, storm flows or storm surges can escape the active channel and access adjacent benches, riparian areas, or the marsh plain. However, unnatural levees, berms or adjacent land uses restricts the extent of overbank inundation; or naturally confined channel.	0.75
Moderate channel constriction, incision, bank armoring agricultural constraint, or adjacent road precludes water from accessing adjacent benches, riparian areas or the marsh plain, except in very high flows; however, access is still possible.	0.50
All overbank flow beyond the bankfull channel is contained within a defined conveyance or channel and cannot access adjacent riparian areas, benches or marsh plain.	0.25
Channel is channelized and contains concrete or rip-rap slopes/bottom.	0.0
7. *(field)* Surface Water Persistence and Recharge	
Evidence of surface water ponding/storage on floodplain for greater than one day (intermittent). Substrate porosity is such that runoff persists; floodplain has complex microtopographic relief; or perennially flowing/saturated; or adjacent wetlands.	1.0
Evidence of surface water ponding/storage on floodplain for greater than one day (intermittent). Floodplain has simple microtopographic relief. (Non-wetland floodplain).	0.75
Evidence of surface water ponding/storage for less than one day (ephemeral).	0.50
Assessment area provides no features for ponding/storing water. Variable is recoverable and sustainable through natural processes.	0.25
Assessment area provides no features for ponding/storing water. Variable is not recoverable and sustainable through natural processes under current conditions.	0.0
8. *(field)* Floodprone Area	
Floodprone area not modified by cultural processes. FPA > 2.0x bankfull width.	1.0
Floodprone area confined by artificial structure(s) or culturally accelerated channel incision is minimal; FPA > 2.0x bankfull width; disturbance affects one side of drainage; or naturally v-shaped channels for small drainages.	0.75
Floodprone area is artificially confined or culturally accelerated channel incision is present; FPA > 1.5x bankfull width; disturbance affects one side of drainage.	0.50
Floodprone area is artificially confined or culturally accelerated channel incision is present; FPA < 1.5x bankfull width; disturbance affects both sides of drainage; variable is recoverable through natural processes under current conditions.	0.25
Floodprone area is artificially confined or culturally accelerated channel incision is present; FPA < 1.5x bankfull width; disturbance affects both sides of drainage Variable is not recoverable through	0.10

Date _____ Newhall Site _____

Stream Reach Number _____

Surveyor Initials _____ Assessment Area (AA) Number _____

natural processes under current conditions.	
Floodprone area is completely modified by concrete and/or rip-rap; disturbance affects both sides of drainage; variable is not recoverable through natural processes under current conditions.	0.0

Habitat Metrics – Physical Structure Metrics (CRAM, LLFA, HGM)

9. *(field)* Topographic Complexity	
Assessment area is dominated by a complex arrangement of micro and macro topographic features, such as meanders, bars, benches, secondary channels, backwaters, roots, pits, and ponds. Higher gradient systems may contain plunge-pool sequences.	1.0
Some macrotopographic features present, such as secondary channels; however, the complexity and interspersion of such features has been reduced by substrate alteration, flooding, grazing, trampling, or placement of fill material; or naturally v-shaped channel is a small drainage.	0.75
Assessment area consists of a single channel without macrotopographic features such as benches or secondary channels; however, the channel has microtopographic features such as bars, braiding, and presence of woody debris.	0.50
Assessment area consists of a single channel without macrotopographic features such as benches or secondary channels; however, the channel has microtopographic features such as bars, braiding, and presence of woody debris. Features may be the result of anthropogenic disturbance.	0.25
Assessment area consists of a uniform, straight channel with no substantive topographic features.	0.10
10. *(field)* Substrate Condition	
Soils in the assessment area or adjacent to the active channel are relatively intact, show evidence of surface organic matter accumulation, fallen trees, branches, and twigs or other course woody debris, decayed leaf litter, and a fine detritus of organic matter. Redoximorphic features may be visible within 30 cm of the surface; organic or clay layers may be present within the soil column (top 30cm).	1.0
Channel and adjacent benches are dominated by unconsolidated sand or other poorly formed native soils and/or bedrock outcrops. Substrate may exhibit moderate embeddedness or compaction; lack of organic layers in column; cattle may have had minor to moderate effects on sandy substrates.	0.75
Soils may exhibit some evidence of sparse organic litter or coarse woody debris. However, the assessment areas is mainly characterized by disturbed conditions, such as substantial filling, compaction, tilling, grazing, or similar activity, but appear recoverable with minimal intervention.	0.50
Soils are extremely compacted, dominated by imported fill or other predominantly upland (non-native) soils or have been deeply ripped, disced, or drained.	0.25
Channel is lined with concrete or rip-rap.	0.0

Habitat Metrics – Biotic Structure Metrics (CRAM, LLFA, HGM)

11. *(field)* Vertical Biotic Structure	
Most of the Assessment Area supports 3 height classes of vegetation; T/S/H; may also include vine layer.	1.0
About half of the Assessment Area supports 3 vegetative strata and/or most is covered by at least 2 height classes.	0.75
Between one quarter and half of the assessment areas supports 3 vegetative height classes and/or at least half of the site support 2 height classes.	0.50

Date _____ Newhall Site _____

Stream Reach Number _____

Surveyor Initials _____ Assessment Area (AA) Number _____

Less than one quarter of the Assessment Area supports 3 height classes OR less than one-half supports 2 or more height classes OR only one height class is present.	0.25
12. *(field)* Interspersion and Zonation	
2 or more plant zones exist along most of the active channel or shoreline, plus various tributary channels, meander scars, paleo-channels, or other features, producing a complex mosaic of vegetation in overhead view (zones can include submerged or emergent vegetation).	1.0
2 or more plant zones exist along about half of the main active channel or shoreline, and along a few of the tributary channels and other topographic features.	0.75
2 or more plant zones are apparent along about one quarter to half of the main active channel or shoreline.	0.50
2 or more plant zones are apparent along less than one quarter of the active channel.; OR sparse shrubs occur in confined/ incised channel.	0.25
Unvegetated channel.	0.10
13. *(field)* Ratio of Native to Non-Native Plants	
75 – 100% of the plant species are native and no stratum is dominated by non-native species.	1.0
50 - < 75% of species are native and/or up to 25% of the strata present are dominated by non-native species.	0.75
25 - < 50% of species are native and/or up to 25% of the strata present are dominated by non-native species.	0.50
10 – < 25 %of species are native and/or up to 50% of the strata present are dominated by non-native species.	0.25
0 - < 10 % of species are native and/or up to 100% of the strata present are dominated by non-native species.	0.10
No vegetation present. Variable is not recoverable and sustainable through natural processes under current conditions.	0.0
14. *(field, includes sub-watershed area outside of AA)* Riparian Vegetation Condition	
Vegetation represents reference condition with no chronic disturbance or recovered from historical disturbance. Presence of areas disturbed through natural processes (i.e., fire and flood) do not detract from score.	1.0
Native vegetation recovering with minor chronic disturbance (i.e., grazing). Presence of areas disturbed through natural processes (i.e., fire and flood) do not detract from score. Invasive, exotic species may be present.	0.75
Native vegetation common and widespread with moderate grazing pressure. Presence of areas disturbed through natural processes (i.e., fire and flood) do not detract from score. Invasive, exotic species may be present.	0.50
Native vegetation localized with heavy grazing pressure. Presence of areas disturbed through natural processes (i.e., fire and flood) do not detract from score.	0.25
Native vegetation absent, area hardened (i.e., paved, urban, etc.) or graded. Restoration impractical and unlikely for economic or political reasons.	0.0
15. *(office, verify in field, includes sub-watershed area outside of AA)* Riparian Corridor Continuity	
<5% of riparian reach with gaps/breaks due to cultural alteration.	1.0
>5 and <15% of riparian reach with gaps/breaks due to cultural alteration.	0.75
>15 and <30% of riparian reach with gaps/breaks due to cultural alteration.	0.50
>30 and <50% of riparian reach with gaps/breaks due to cultural alteration.	0.25
>50% of riparian reach with gaps/breaks due to cultural alteration.	0.10

Date _____ Newhall Site_____

Stream Reach Number_____

Surveyor Initials _____ Assessment Area (AA) Number_____

Newhall Hybrid Functional Assessment Datasheet Notes - Riverine Wetlands Class

Step 1. Establish reaches and Assessment Areas (AAs) on aerial imagery. Use table below to help delineate AAs.
Step 2. Complete and initial score for functions 1,2,3,4,5,6,8, and 20 on each AA in the office. Use the notes for these functions below. These initial scores will be verified and updated as required during the field visit.
Step 3. Conduct the field visit and score all functions in each AA. Use the notes for all functions below. Note that there are two broad sets of functions – those that are evaluated and scored inside the established AA only, and those that require you to assess function conditions within the AA as well as along the majority of the selected reach in which the AA occurs to arrive at a function score. For this reason, look at as much of the reach as time permits. Functions 4,5,8,11,18,19,20 and 21 require an evaluation outside of the AA boundaries, and may be the last ones you score in a reach.

FEATURES USED TO DELINEATE RIVERINE AAs
• grade or water height control structures • weirs and other flow control structures • lotic-lentic transitions • natural falls • culverts • inlets and outlets (end-of-pipe discharges) • diversion ditches (brow ditches) • channel confluences • dams, levees, and banked road grades • uplands (*i.e.*, terrestrial breaks in floodplains, shorelines, riparian habitats) • open water areas broader than the wetlands (*i.e.*, wetlands on opposite shores of a large river) • major changes in degree of channel confinement, degradation, aggradation, slope, or bed form
FEATURES NOT USED TO DELINEATE RIVERINE AAs
• unpaved, unimproved single-lane roads • at-grade roads or Arizona crossings • bike paths and jogging trails at grade • equestrian trails • fences (unless designed to obstruct the movement of wildlife) • bare ground on the active floodplain or below the ordinary high water line • riffle – glide – pool transitions within a homogeneous reach of these features • spatial changes in land cover or land use along the wetlands border • property boundaries • state and federal jurisdictional boundaries
Source: CRAM Version 3.0.

1. Divide the perimeter of the AA into four sections, estimate the width of the buffer in each of the four sections up to 100m per side and calculate the mean buffer width.

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2. Assess vegetative cover, substrate condition, and indicators of disturbance. If buffer sides vary in condition, score each side and calculate mean buffer condition score.
3. Assess the percentage of the drainage basin with land use/land cover types having the potential to increase the nutrient, pesticide, hydrocarbon, or sediment loading in downstream surface waters upland areas adjacent to and upstream from the reach being assessed (stressors - secondary or tertiary treated water inputs, oil production platforms, agricultural fields, paved roads, *etc.*).
4. Assess the primary origin of water input to the assessment reach and the degree to which water input has been affected or is controlled by adjacent land use activities including upstream activities (stressors - septic tanks, outfalls, urban and agricultural runoff, *etc.*)
5. Assess evidence of diversions, flow augmentations, or upstream constrictions. Dams and other upstream impoundments impact the hydroperiod if they control more than 25% of the upstream drainage area of the AA or if they are close enough to the AA to substantially affect the magnitude or timing of inflows. Diversions affect hydroperiod if they routinely reduce either base flow or storm flow to the assessment reach by more than 15%. Constrictions of the active channel within 1 km (upstream) of the AA also alter hydroperiod.
6. Assess degree of channel incision and look for evidence of extent and vigor of inundation of banks or terraces and overbank flow including wrack, debris, fine sediment deposits, and evidence of ponding on benches/terraces adjacent to the stream channel. Consider channel depth, presence of natural or man-made levees, and stream bank condition.
7. Assess the potential for surface water storage including the adjacent floodplain (note presence/absence of any hydrophytic vegetation). Perennial streams and wetlands will generally score higher than ephemeral/intermittent streams unless significant modifications to stream features have occurred.
8. Assesses the extent to which the lateral spread of flood flows are impeded by channel and buffer modifications (stressors – excessive channel incision, concrete channels, , development of floodplain, berms, walls, cisterns,
9. Count the number of micro-topographic features that affect stream elevation or influence the path of water flowing along a transect line through the AA (hummocks, pools, debris jams, multiple incised channels of various depths, sediment bars, micro-terraces, *etc.*) Lower order riverine wetlands and ephemeral channels have less topographic complexity and subtle indicators including large rocks, middens, or accumulations of woody debris. Trampling, filling, burying or other alterations of topographic features indicate a degraded condition.
10. Assess the presence or absence of intact, unaltered soil that is regularly saturated/inundated and has an accumulation of organic matter or coarse litter. Look for sub-surface redoximorphic features (top 30 cm of substrate), ponding, or organic matter accumulation, and observe any pits, ponds, backwaters and the floodplain within the AA (good condition indicators - leaf litter accumulation, coarse woody debris, dried algal mats, algal coating on sand grains in the channel bed, organic streaking in the soil horizon, etc.). Excessive sediment deposition, filling, down cutting, trampling, or compaction will reduce the score.
11. Count the number of vegetation height classes within the AA (canopy = >3m, shrub = 3m to 1m, herb = >1m).

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12. Assess the horizontal structure of the AA by counting the number of different kinds of plant patches (minimum patch size is generally 3m by 3m) including all standing vegetation. These patches correspond to the Keeler-Wolfe plant series mapped for the area and/or general biotic patch types (*e.g.*, grasses, forbs, shrubs, vines, short and tall deciduous trees, short and tall evergreen trees, short and tall sedges/rushes, emergent macrophyte beds, floating macrophytes). Each patch should signify a different elevation or distance away from the usual high water mark or contour and the transition from the wetlands to the adjacent uplands is the primary evaluation zone in dry systems. Plant zones may be discontinuous and can consist of more than one plant species, but some zones may be mono-specific. In most cases, one plant species dominates each zone. Evaluate the number of zones present and the degree of interspersion among these zones (from a hypothetical plan view).
13. Briefly collect vegetation data in a 10 m X 50 m plot within the AA. Make separate lists of native and non-native herbs, shrubs and trees within the plot and use the ACOE 50/20 rule to determine dominant vegetation in each stratum if necessary. This data will also be used for steps 17 and 21.
14. Observe the general condition of the riparian corridor (floodprone area) in the reach (stressors – undercutting, grazing, grading, herbicidal control, insect infestations, *etc.*).
15. Estimate the percent of flood prone area along the main stem channel of the riparian reach occupied by native and non-native vegetation communities with adequate height and structure to allow faunal movement (*i.e.*, annual grassland with no shrub or tree component represents a corridor gap).