

**SECOND AND THIRD ANNUAL
MONITORING REPORT**

**QUAIL HOLLOW BRIDGE REPLACEMENT PROJECT
ALUM ROCK PARK, SAN JOSE, CALIFORNIA**

Submitted to:

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LSA Project No. SJO0607B

LSA

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1.0 PROJECT OVERVIEW

This report details the second and third year of annual monitoring of mitigation plantings and in-stream wetlands for the Quail Hollow Bridge Replacement project. Annual monitoring of the mitigation site fulfills the requirements of the following permits obtained for the project:

- Corps of Engineers Nationwide Permit 14, 27, 33 (File Number 27383S)
- Regional Water Quality Control Board Water Quality Certification (File No. 2188.07 (bkw); Site No. 02-43-C0423)
- California Department of Fish and Game Streambed Alteration Notification Number: R3-2002-0903.

The project is located in Alum Rock Park in southeastern San Jose at the base of the eastern foothills of the Santa Clara Valley and the Diablo Mountain Range approximately 0.8 mile from the park entrance along Penitencia Creek Road (Figure 1, Appendix A). The project site is adjacent to the Quail Hollow Picnic Area and parking lot. It includes the Quail Hollow Bridge and the Upper Penitencia Creek channel and banks approximately 400 feet up and downstream from the bridge (Figure 2, Appendix A).

The 2004 bridge project consisted of replacing a failing, concrete low water crossing with a pre-fabricated, single-span pedestrian bridge over Upper Penitencia Creek at Quail Hollow in Alum Rock Park that was eroding the streambank and creating a barrier to fish passage. The work included removing the concrete footings and four 36-inch culverts, re-contouring approximately 150 feet of channel along the creek, and installing four rock weirs to provide grade controls and create step pools as habitat for aquatic species such as steelhead (*Oncorhynchus mykiss*) Central California Coast Evolutionary Significant Unit (ESU) and California red-legged frog (red-legged frog) (*Rana draytonii*). The weirs were subsequently modified in the summer of 2005 to meet the design objectives. The project permanently impacted approximately 150 linear feet of creek bank and a surface area of 7,500 square feet (0.17 acre). Seven willows (*Salix* sp.) and one California sycamore (*Platanus racemosa*) were removed during construction. Permanent impacts to the creek and riparian habitat are expected to improve the habitat and stability of the creek. Temporary impacts associated with stream flow diversion consisted of 225 linear feet of the creek and a surface area of 0.04 acre.

Compensatory mitigation for these impacts specified the establishment of 9,000 square feet (0.2 acre) of native riparian woodland vegetation in the project area by the end of the five year monitoring period. Approximately 1,660 square feet of that riparian vegetation needs to provide shade for the creek (Shaded Riverine Aquatic habitat). The revegetation plans specified planting 64 native container shrubs and trees and 89 willow poles and seeding disturbed areas with a non-invasive erosion control seed mix. In-stream wetlands that were disturbed during the project construction also need to become naturally reestablished in the project area.

In June of 2005 Central Coast Wilds (CCW) installed the irrigation system at the project site. In October 2005 CCW installed the mitigation plantings in the project area according to the revegetation plans. Since then CCW has maintained the plantings and irrigation system in conformance with the mitigation monitoring requirements. During site visits conducted on February 4 and 14, 2008 and

November 5 and 6, 2008, LSA Associates, Inc. (LSA) botanist Michele Lee evaluated the success of the riparian plantings and in-stream wetlands establishment and determined the survival rates of individual species. The monitoring results are described in more detail in Section 4.

2.0 RESPONSIBLE PARTIES

Monitoring and Reporting

LSA Associates, Inc.

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Permittee

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3.0 MONITORING REQUIREMENTS AND PERFORMANCE CRITERIA

The agency permits obtained for the Quail Hollow Bridge Replacement project specify performance criteria for measuring the success of the mitigation plantings and the establishment of in-stream wetlands. Regulatory Permits that were required to complete the bridge replacement project included:

- Corps of Engineers Nationwide Permit 14, 27, 33 (File Number 27383S).
- Regional Water Quality Control Board Water Quality Certification (File No. 2188.07 (bkw) Site No. 02-43-C0423).
- California Department of Fish and Game Streambed Alteration Notification Number: R3-2002-0903.

Environmental documents that provide guidelines for the mitigation and monitoring phase of the project include:

- Mitigated Negative Declaration, Quail Hollow Bridge Replacement Project, September 23, 2002 (File Number PP02-09-235).
- Alum Rock Park Riparian Management Plan (Biotic Resources Group 2001).

A summary of performance measures and maintenance requirements contained in these permits and environmental documents follows. The site is to be monitored annually for compliance with these performance measures during the first five years following project implementation.

Performance Measure 1: Riparian Plant Survival. The survival rate for the first three years of post-construction monitoring is 80 percent for container stock plantings of trees and shrubs, and 60 percent for willow poles. The revegetation plans specify planting 64 container plants and 89 willow poles. An 80 percent survival rate for 64 container plants is 52 plants. A 60 percent survival rate for 89 willows is 54 willows. If this criterion is not met, dead plants should be replaced in kind unless the site is not conducive to the survival of a particular species, then an alternative native riparian species may be planted. Replacement plants should be installed within one year of the survival rates falling below the numbers as described above. Plant materials should be collected locally from Alum Rock Park. Replacement plants need to be monitored for five years from the date of replanting.

By Year Five the survival rate for all the plantings should be 80 percent. Eighty percent of 153 total plantings is 123 plantings. If this is not achieved by Year Five, replanting and monitoring will be conducted until the 80 percent success rate is achieved.

Monitoring Parameters: Plant Mortality Counts. The mortality of any planted trees and shrubs will be recorded during regular maintenance activities and annual monitoring will include a count of all trees and shrubs by species.

Performance Measure 2: Riparian Plant Cover. The cover of the planted trees and shrubs should be 70 percent after 3 years and 75 percent after 5 years according to the California Department of Fish and Game Streambed Alteration Notification permit. In addition, according to the *Alum Rock*

Park Riparian Management Plan (Biotic Resources Group 2001), by year five native trees should provide a total cover of at least 25 percent of the site and native shrubs should provide total cover of at least 20 percent of the site. The revegetation plans for the mitigation area estimate that the 64 container plants and 89 willows will provide approximately 9,000 square feet (0.2 acre) of riparian vegetation by year 5. By year Five, approximately 1,660 square feet of that riparian vegetation will provide shade for the creek (Shaded Riverine Aquatic habitat). If the plantings do not provide 1,660 square feet of shade cover by Year Five, additional plants need to be installed.

Monitoring Parameters: Cover Estimates. The total absolute cover of the plantings will be visually estimated to the nearest 5 percent and reported annually. Cover will be estimated for the entire project area and each of the four quadrants in the project area. The cover estimates will also provide data for the total square feet of riparian vegetation in the project area. The square feet of riparian vegetation overhanging the creek channel (Shaded Riverine Aquatic habitat) will also be visually estimated each year.

Performance Measure 3: Riparian Plant Height. The heights of the planted trees and shrubs should be monitored and reported annually. By year five the heights of the some tree species should attain the heights specified in Table 12 of the Alum Rock Park Riparian Management Plan (Biotic Resources Group 2001). Valley oak (*Quercus lobata*) should be at least 6 feet tall by year five. California sycamore (*Platanus racemosa*) and willows (*Salix* spp.) should be at least 10 feet by year five. Mexican elderberry should be a least 8 feet tall by year five.

Monitoring Parameters: Height Measurements. The height of the planted trees and shrubs will be measured and recorded annually to the nearest inch. When the planting become more established in subsequent years, heights may be estimated to the nearest half foot.

Performance Measure 4: Weed Control. The cover of invasive weeds should be maintained at less than 10 percent except for periwinkle (*Vinca major*) which can have a cover of 25 percent due to its vigorous growth and difficulty in eradicating it. All invasive plants removed from the site should be bagged and disposed of off-site. By year five the height of weeds in the basins of planted trees and shrubs should be less than 6 inches.

Monitoring Parameters: Weed Removal. Regular maintenance of the mitigation plantings includes the inspection and weeding of the planting basins and the mitigation site. Annual monitoring will also include a visual estimate of the cover of invasive weeds on the site.

Performance Measure 5: Instream Wetland Vegetation Establishment. The instream wetlands that were impacted by the project should naturally reestablish following construction. If these wetlands do not reestablish after two years, in-kind mitigation will be implemented at a 1:1 ratio for an area covering 100 square feet.

Monitoring Parameters: Vegetation Cover. The square feet of instream wetlands will be visually estimated within each quadrant of the project area. Notes on the dominant and associated plant species will be recorded.

Performance Measure 6: Geomorphic Stability of Channel. The geomorphic stability of the channel should be evaluated annually and include a survey of the thalweg over the project reach and

three cross sections; evaluation of the rock weirs and fish passage; and assessment of sedimentation, erosion and scouring.

Monitoring Parameters: Geomorphology Monitoring. A qualified geomorphologist will conduct a geomorphic assessment of the channel, and survey at least three cross-sections and a longitudinal profile and evaluate the stability of the channel and weirs.

Performance Measure 7: Photographic Documentation. Baseline photographs will be taken from a minimum of four permanent photo points. Additional photographs will continue to be taken during routine monitoring from the same vantage point to record any changes to the site conditions and bank conditions immediately upstream and downstream of the site.

Monitoring Parameters: Photographic Monitoring. Photographs will be taken annually at five permanent photo points from the same direction to document the changes over time.

4.0 RESULTS

4.1 MONITORING

The second year (year 2) of annual monitoring of the mitigation plantings and instream wetlands was conducted by LSA botanist, Michele Lee, on February 4 and 14, 2008. The third year (year 3) of annual monitoring of the mitigation plantings was conducted by LSA botanist, Michele Lee, on November 5 and 6, 2008. The results are evaluated in the following section to determine if the site meets each performance measure.

Performance Measure 1: Riparian Plant Survival. Table 1 summarizes the container plant survival counts for the past three monitoring years (year 1 through year 3). The survival of container plants has met the performance criterion in all three monitoring years. An 80 percent survival rate for 64 container plants is 52 plants and the number of plants has exceeded 52 in all three years.

Willow survival criterion was not met in year 1 or year 2 but was met in year 3. Willow survival was low during the year 1 and year 2 monitoring and willow poles were replanted to replace dead willows. The initial planting plans specified planting 89 willow poles. The performance criterion requires a 60 percent survival rate (54 willows). During the year 1 monitoring (January 3, 2007) there was a total of 21 willows and since this number fell below the criterion of 54 willows, on February 5 and 6, 2007 CCW installed 83 willow poles in the mitigation area. During the year 2 monitoring (February 14, 2008) there was a total of 40 willows that had survived from previous years and since this number fell below the criterion of 54 willows, prior to the monitoring on January 17, 2008, CCW installed 67 willow poles in the mitigation area. During the year 3 monitoring (November 6, 2008) there was a total of 91 willows. The survival criterion of 54 willows was met in year 3.

In addition to the plantings, there is a memorial shrub and some volunteer native shrubs in the mitigation area. In November or December 2007, a family in the local community planted a native holly-leaved cherry (*Prunus ilicifolia*) in the mitigation area as a memorial shrub and the irrigation system was extended to it. Native shrubs and seedlings on the site that are natural recruits include willows, coast live oak (*Quercus agrifolia*), valley oak, California bay (*Umbellularia californica*), California sagebrush (*Artemisia californica*), California blackberry, button bush (*Cephalanthus occidentalis* var. *californicus*), and California rose. Many coyote brush (*Baccharis pilularis*) have established on the site, especially on the northern bank.

Performance Measure 2: Riparian Plant Cover. In year 2, the absolute cover of the riparian plantings in the entire project area was approximately 10 percent and was approximately 15 percent when the cover of native volunteer shrubs and trees is included. In year 3, the absolute cover of the riparian plantings in the entire project area was approximately 20 percent and was approximately 35 percent when the cover of native volunteer shrubs and trees is included. In year 2, the total vegetation cover of all native and non-native plants in the understory of the project area was approximately 75 percent, and in year 3 it was approximately 80 percent. These estimates of total vegetation cover exclude the existing trees in the upper canopy layer and the unvegetated creek channel.

Table 1: Summary of Container Plant Survival Counts for Year 1 through Year 3

	Number Specified in Planting Plans	Number Alive Year 1 (1-3-2007)	Number Alive Year 2 (2-4-2008 and 2-14-2008)	Number Alive Year 3 (11-5-2008 and 11-6-2008)
Container Plants				
<i>Aesculus californica</i> California buckeye	2	2	2	2
<i>Artemisia douglasiana</i> mugwort	12	9	9	12
<i>Platanus racemosa</i> California sycamore	4	4	4	4
<i>Quercus agrifolia</i> coast live oak	0	1	1	1
<i>Quercus lobata</i> valley oak	2	2	2	2
<i>Ribes californica</i> hillside gooseberry	5	5	5	5
<i>Rosa californica</i> California rose	12	12	12	12
<i>Rubus ursinus</i> California blackberry	20	23	23	23
<i>Sambucus mexicana</i> Mexican elderberry	7	6	6	6
TOTAL	64	64	64	67

The understory of the site is naturally sparse in some areas because the site supports existing mature trees, including willows and California buckeye that shade portions of the site and create leaf litter in the understory (Figure 3). The cover of the riparian plantings and native volunteer shrubs and trees is approximately 70 percent, which meets the cover criterion for year 3, when the unvegetated channel and areas shaded by the upper canopy of existing mature trees and the bridge are excluded. In subsequent years, some of the willows that are still becoming established will also provide additional cover in the project area and the cover in the planting areas will likely meet the criterion of 75 percent by year 5.

In addition to the riparian plantings, vegetation in the understory of the project area consists of native and non-native grasses, forbs, shrubs, and small trees. Most of the understory consists of grasses and forbs and some leaf litter. Coyote brush has become more abundant since year 1 especially on the northern bank. Native forbs in the understory include California poppy (*Eschscholzia californica*), horsetail (*Equisetum* sp.), mugwort, and willow herb (*Epilobium ciliatum*). Native shrubs and seedlings on the site that were natural recruits include willows, coast live oak (*Quercus agrifolia*), valley oak, California bay (*Umbellularia californica*), California sagebrush (*Artemisia californica*), California blackberry, button bush (*Cephalanthus occidentalis* var. *californicus*), and California rose. Many coyote brush (*Baccharis pilularis*) have established on the site, especially on the northern bank. Non-native grasses include smilo (*Piptatherum miliaceum*), wild oat (*Avena* sp.), Italian ryegrass (*Lolium multiflorum*), red brome (*Bromus madritensis*), and rabbitsfoot grass (*Polypogon monspeliensis*). Non-native forbs include curly dock (*Rumex crispus*), fumitory (*Fumaria* sp.), prickly lettuce (*Lactuca serriola*), and cut-leaved geranium (*Geranium dissectum*). Periwinkle (*Vinca major*), poison hemlock, black mustard, and Bermuda buttercup (*Oxalis pes-caprae*) are invasive weeds that occur on the site.

The year 1 annual monitoring report for the site reported that only two willows along the northwestern bank that provided approximately 8 square feet of shade over the channel (Shaded Riverine Aquatic habitat) (LSA 2007). These two willows are located adjacent to the channel and were estimated to provide shade over the active channel (low flow channel) on January 3, 2007 as observed by the water level on that date. In year 2, only 1 willow near the channel provided approximately 9 square feet of shade over the active channel (Shaded Riverine Aquatic habitat) (SRAH). However, it was noted in year 3 that the active channel during the November 5 and 6, 2008 monitoring was below the ordinary high water mark and in Year 3 the Shaded Riverine Aquatic habitat shade over the channel was estimated by including the cover of plants that were planted below the OHWM or whose canopy shaded the area below the OHWM. One Mexican elderberry and many willows provide 473 square feet of shade over the channel within the OHWM. The willow survival rate was higher in year 3 than in year 2 and year 1 and they are expected to provide additional coverage over the channel in year 4 and year 5. However, the riparian plantings below OHWM might not provide 1,660 square feet of shade over the channel by year 5. In year 4 and 5 riparian plantings and existing trees and shrubs that are adjacent to the OHWM should be evaluated for potential shade they provide below OHWM.

Performance Measure 3: Riparian Plant Height. Table 2 provides a summary of the average plant height for each species from Year 1 through Year 3. Most of the planting were in good condition except for some of the willows in Year 2. There has been very low mortality in the container plants and overall the heights of the riparian plantings have increased each year.

Performance Measure 4: Weed Control. Planting basins are weeded during regular maintenance visits two times a month in the growing season (March to October) and once a month during the

Table 2: Summary of Average Plant Height for Year 1 through Year 3

	Average Height (feet) Year 1 (1-3-2007)	Average Height (feet) Year 2 (2-4-2008 and 2-14-2008)	Average Height (feet) Year 3 (11-5-2008 and 11-6-2008)
Plant Species			
<i>Aesculus californica</i> California buckeye	0.6	1.0	1.0
<i>Artemisia douglasiana</i> mugwort	1.9	1.5	1.9
<i>Platanus racemosa</i> California sycamore	2.2	2.7	3.5
<i>Quercus agrifolia</i> coast live oak	0.2	0.3	0.7
<i>Quercus lobata</i> valley oak	2.2	2.5	3.7
<i>Ribes californica</i> hillside gooseberry	2.6	3.4	3.6
<i>Rosa californica</i> California rose	2.6	3.3	3.7
<i>Rubus ursinus</i> California blackberry	0.6	1.3	1.4
<i>Salix lasiolepis/Salix laevigata</i> red willow/arroyo willow	1.8	2.4	2.8
<i>Sambucus mexicana</i> Mexican elderberry	2.0	3.6	5.1
TOTAL AVERAGE	1.7	2.2	2.8

dormant season (November to February) to remove all weed from the basins, and in the winter the maximum height of weeds in the basins is 6 inches. The maximum height of weeds in the mitigation area is 6 inches. Weeds are mowed, hand removed, or weed-whipped.

Invasive weeds on the site include periwinkle (*Vinca major*), poison hemlock (*Conium maculatum*), black mustard (*Brassica nigra*), Bermuda buttercup (*Oxalis pes-caprae*), and milk thistle (*Silybum marianum*). The total cover of each of these species is below the criteria of less than 10 percent total cover for invasive weeds and less than 30 percent cover for periwinkle. These weeds have been periodically removed from the site as part of the routine site maintenance. Periwinkle primarily occurs on the southeastern bank and southwestern bank. Its average cover on the site during the February 2008 (year 2) monitoring was approximately 20 percent and approximately 10 percent during the November 2008 (year 3) monitoring. In year 2 the total cover of all invasive weeds besides periwinkle was approximately 8 percent and in year 3 it was approximately 4 percent.

Performance Measure 5: Instream Wetland Vegetation Establishment. In year 2, the total cover of wetland vegetation in the instream wetlands in the project area was approximately 15 percent. The project streambank area is approximately 240 linear feet and instream wetlands are approximately 30 feet wide. The square feet of instream wetlands in Year 2, excluding the area under the bridge and areas without vegetation, was approximately 665 square feet. The dominant plants are native water cress (*Rorippa nasturtium-aquaticum*), young grasses, and tall flat sedge (*Cyperus eragrotis*). Other associated species include native hydrophytes such irisleaf rush (*Juncus xiphioides*), slender willowherb (*Epilobium ciliatum*), button bush, dwarf nettle (*Urtica urens*), and hoary stinging nettle (*Urtica dioica* ssp. *holosericea*). Associated non-native hydrophytes include curly dock and rabbitsfoot grass. In year 3 the instream wetland vegetation was present and still well established. The instream wetlands meet the performance criteria and do not require additional monitoring.

Performance Measure 6: Geomorphic Stability of Channel. Based on a visual evaluation of the site during the year 2 and 3 riparian monitoring, the project is performing well and meeting the design criteria. The rock weirs are stable, function well through the winter flows, and provide fish passage. The depth of the step pools is excellent and provides aquatic habitat. A survey of the longitudinal profile and three cross sections in the project area will be conducted in the spring/summer 2009.

Performance Measure 7: Photographic Documentation. Photographs were taken on November 6, 2008 and February 14, 2008 from the five permanent photo points. The location of these photo points is shown in Figure 2. Photographs of existing conditions are provided in Appendix B.

4.2 MAINTENANCE ACTIVITIES

CCW conducts landscape maintenance activities at the mitigation area at least twice a month during the growing season (March to October) and once a month during the dormant season (November to February).

The following maintenance activities are regular periodic activities that will be conducted for the five year monitoring period.

- Removal and in-kind replacement of dead plants.
- Programming irrigation controllers to respond to change of seasons and plant watering requirements and to minimize irrigation run-off.

- Inspect and test the irrigation system and make repairs.
- Verify condition of wire mesh around plantings every month and repair or replace broken ones as needed. Remove wire mesh cages as needed when plants outgrow them.
- Replacement of mulch in planting basins as needed to maintain a 3 inch layer of mulch.
- Removal of weeds from planting basins two times a month in the growing season (March to October) and once a month during the dormant season (November to February) to remove all weed from the basins. In the winter the height of the weeds in the basin is maintained to be no greater than 6 inches. The maximum height of weeds in the mitigation area is 6 inches. Weeds are mowed, hand removed, or weed-whipped.
- Integrated pest management to control any pest infestations damaging the project area.

Additional maintenance activities performed from February 7, 2007 through November 6, 2008 included the following:

- Willows that were not on the irrigation system were hand watered as needed during the drier months of the year. Container plants were occasionally also given supplemental hand watering as needed during the drier months.
- In November or December 2007, a family in the local community planted a native holly-leaved cherry (*Prunus ilicifolia*) in the mitigation area as a memorial shrub and the irrigation system was extended to it.
- On January 17, 2008, CCW installed 23 red willow poles and 44 arroyo willow poles in the project area. These willow poles were collected from existing willows in the project area and along the creek just upstream and downstream of the project area. These plantings focused on planting arroyo willows adjacent to the channel and below the ordinary high water mark to improve the vegetation cover over the channel (shaded riverine aquatic habitat). Red willows were generally planted higher on the banks of the channel than arroyo willows.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- Overall the site is meeting most of the performance criteria. The container shrubs and trees have high survival rates and the willow poles had lower mortality rates in year 3 compared to previous years. The site is very rocky and willows do not establish and thrive and provide as much Shaded Riverine Aquatic habitat as they would on an average creek with better soil conditions. However, the higher survival of willow poles in year 3 is expected to provide additional vegetation cover and Shaded Riverine Aquatic habitat in the project area in year 4 and year 5.

Recommendations

- In year 4 and 5, in addition to considering the shade provided by riparian plantings that are at or below OHWM, the riparian plantings and existing trees and shrubs that are adjacent to the OHWM should also be evaluated for potential shade they provide below the OHWM.

6.0 REFERENCES

Biotic Resources Group. 2001. Alum Rock Park Riparian Management Plan. Prepared for the City of San Jose, Department of Public Works, Parks and Recreation Facilities Division. April 21, 2001.

California Department of Fish and Game Streambed Alteration Notification Number: R3-2002-0903.

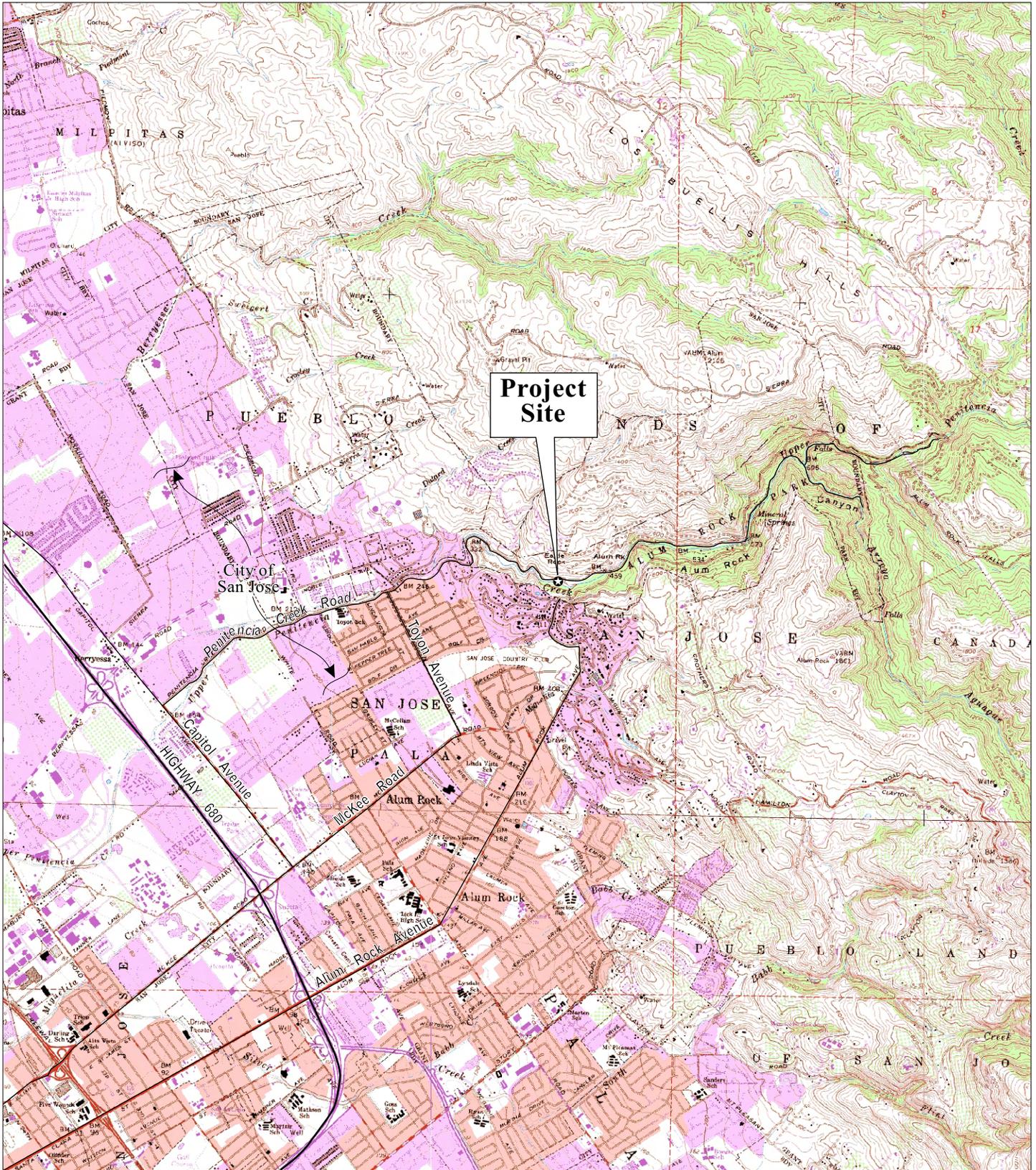
Corps of Engineers Nationwide Permit 14, 27, 33 (File Number 27383S)

Mitigated Negative Declaration, Quail Hollow Bridge Replacement Project, September 23, 2002 (File Number PP02-09-235)

Regional Water Quality Control Board Water Quality Certification (File No. 2188.07 (bkw); Site No. 02-43-C0423)

APPENDIX A

FIGURES



Project Site

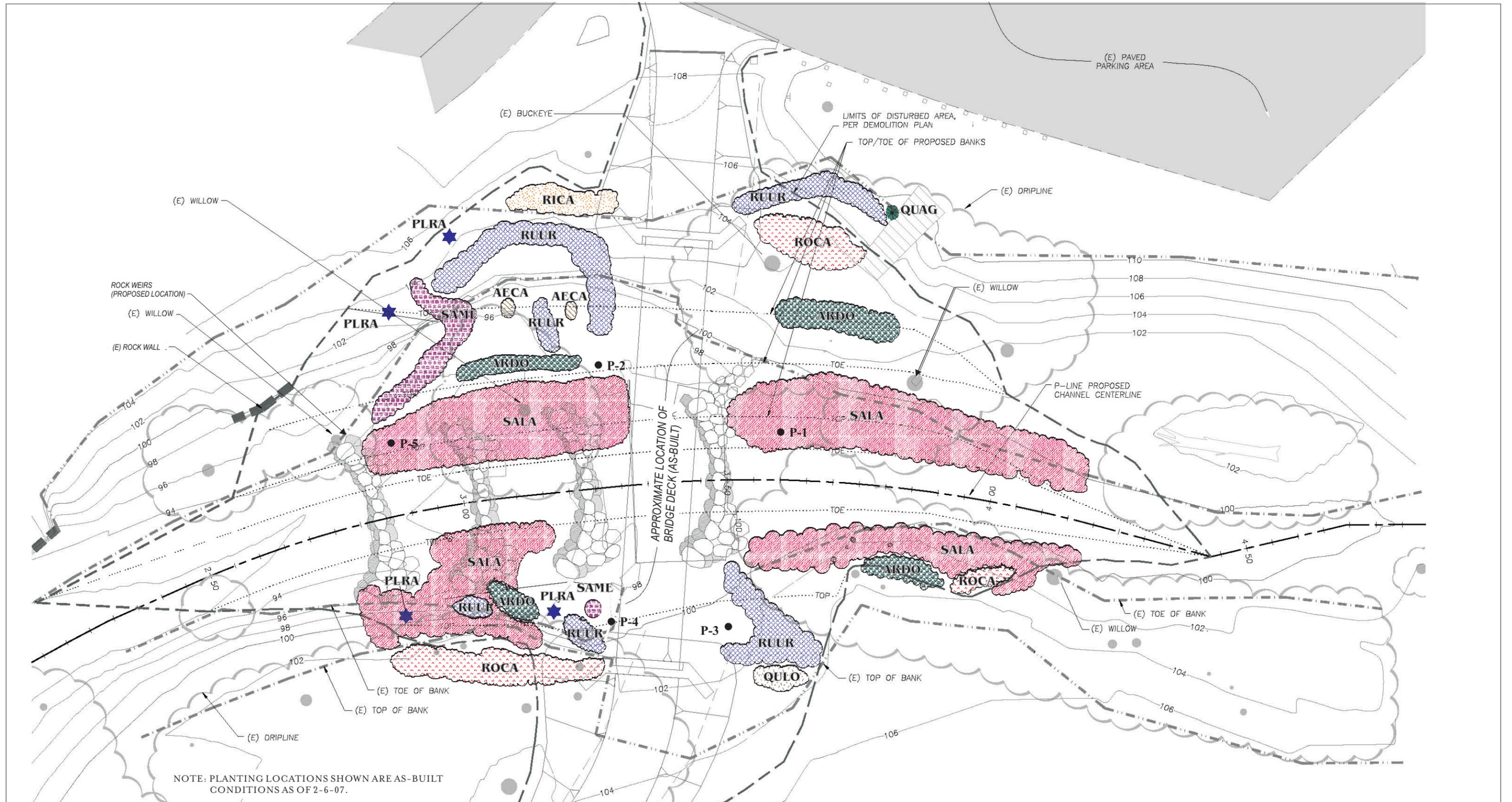
LSA



SOURCE: USGS 7.5' QUADS - CALAVERAS RESERVOIR, AND SAN JOSE EAST, CALIF.

FIGURE 1

*Quail Hollow Bridge Replacement
Project Location*



LSA

LEGEND

- P-4 ● PERMANENT PHOTO POINT (P-1 THROUGH P-5)
- EXISTING TREES

PLANTINGS

- AECA - California buckeye (*Aesculus californica*)
- ARDO - mugwort (*Artemisia douglasiana*)
- PLRA - California sycamore (*Platanus racemosa*)
- QUAG - coast live oak (*Quercus agrifolia*)

- QULO - valley oak (*Quercus lobata*)
- RICA - hillside gooseberry (*Ribes californica*)
- ROCA - California rose (*Rosa californica*)
- RUUR - California blackberry (*Rubus ursinus*)

- SALA - red willow (*Salix laevigata*) and arroyo willow (*Salix lasiolepis*)
- SAME - Mexican elderberry (*Sambucus mexicana*)

NOT TO SCALE

FIGURE 2

Quail Hollow Bridge Replacement
Riparian Plantings

APPENDIX B

SITE PHOTOGRAPHS



Photo Point 1: Photo taken on February 14, 2008 looking southwest at rock weirs and southwestern bank.



Photo Point 1: Photo taken on November 6, 2008 looking southwest at rock weirs and southwestern bank.

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Quail Hollow Bridge Replacement
Site Photographs



Photo Point 1: Photo taken on February 14, 2008 looking southeast at southeastern bank.



Photo Point 1: Photo taken on November 6, 2008 looking southeast at southeastern bank.

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Quail Hollow Bridge Replacement
Site Photographs



Photo Point 2: Photo taken on February 14, 2008 looking south at southwest bank.

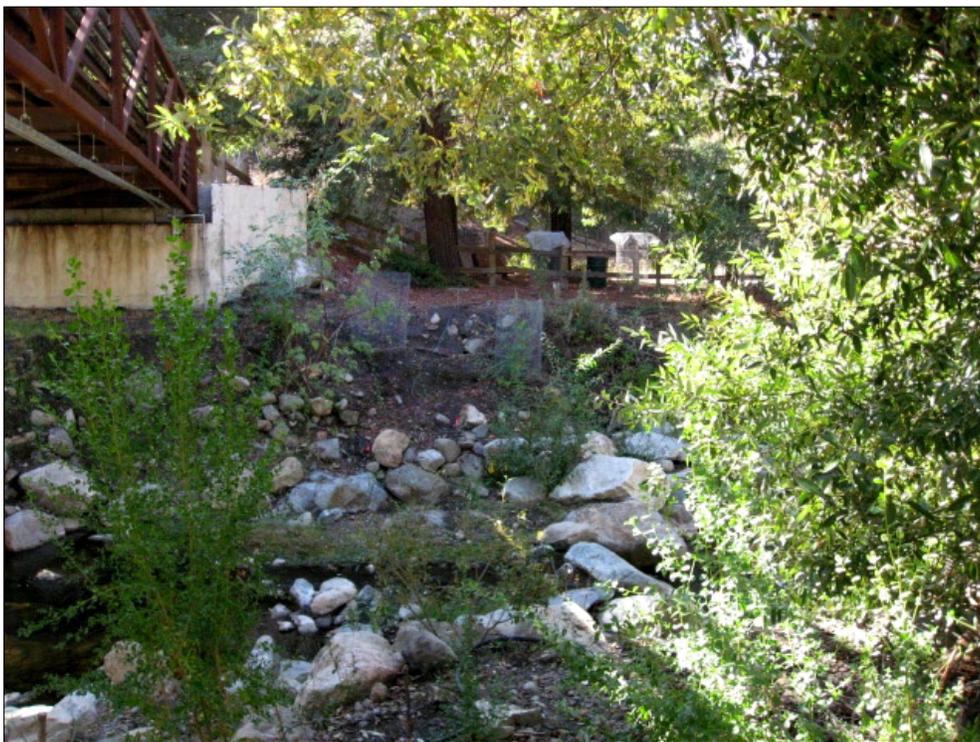


Photo Point 2: Photo taken on November 6, 2008 looking south at southwest bank.

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Quail Hollow Bridge Replacement
Site Photographs

Note: Site Photograph at Photo Point 2 in *First Annual Monitoring Report* (LSA 2007) is inaccurate. It was taken at Photo Point 3 looking northeast at northeastern bank.



Photo Point 3: Photo taken on February 14, 2008 looking north at northeastern bank.



Photo Point 3: Photo taken on November 6, 2008 looking north at northeastern bank.

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Quail Hollow Bridge Replacement
Site Photographs



Photo Point 4: Photo taken on February 14, 2008 looking northwest at northwestern bank.



Photo Point 4: Photo taken on November 6, 2008 looking northwest at northwestern bank.

LSA

Quail Hollow Bridge Replacement
Site Photographs



Photo Point 5: Photo taken on February 14, 2008 looking east at northwestern bank.



Photo Point 5: Photo taken on November 6, 2008 looking east at northwestern bank.

LSA

Quail Hollow Bridge Replacement
Site Photographs