

# LOS GATOS CREEK TRAIL REACH 4 RIPARIAN MITIGATION PROJECT

Third Year Monitoring Report

Prepared for  
City of San Jose

December 2010





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# EXECUTIVE SUMMARY

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On behalf of the City of San Jose, Environmental Science Associates (ESA) is conducting monitoring of the Los Gatos Creek Trail, Reach 4 Riparian Mitigation sites located in San Jose, Santa Clara County, California. This is the third annual monitoring report following planting in 2008. Monitoring is conducted annually in Years 1 through 5 and then again in Years 7 and 10. This report summarizes the third year monitoring results, compares the results of previous monitoring years, evaluates the sites' success at meeting established performance standards, and provides maintenance recommendations.

In January 2008, the City of San Jose restored 0.5 acres of riparian woodland habitat, including 125 linear feet of shaded riverine aquatic (SRA) habitat, as mitigation for impacts to 6,655 square feet (0.15 acre) of riparian woodlands and 34 linear feet of SRA habitat from the Los Gatos Creek Trail, Reach 4 project. Restoration occurred at two sites (Meridian and Auzeais) along Los Gatos Creek in San Jose, California.

The first year annual monitoring was conducted in 2008. The restoration sites were performing very well in the first year. Survival was high and nearly all surviving plants were rated healthy and vigorous. Additionally plant cover was high at this time. The second year annual monitoring was conducted in 2009 and survival and percent cover had decreased significantly. This decrease is most likely attributable to less-frequent site maintenance. However, surviving trees and shrubs generally increased in average height and most plants had moderate to high health and vigor.

This year, overall percent survival decreased again, with 43% of the plantings surviving at the Meridian site and 68% at the Auzeais Site. Total vegetation cover has increased since last year, but was still slightly below the third year performance standard at both sites. The surviving trees and shrubs are performing moderately well. Three of the six tree species are meeting their third year height performance standard and most plantings were rated with moderate to high health and vigor.

Recent frequent maintenance has resulted in low non-native species cover. Frequent maintenance should continue at the site to ensure the project meets its established performance standards. Additionally, trees and shrubs should be replanted at both restoration sites for the project to achieve 80% survival.



# SECTION 1

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## Introduction

### 1.1 Purpose and Background

This report details the annual riparian monitoring results conducted on behalf of the City of San Jose (City) by Environmental Science Associates (ESA) for the Los Gatos Creek Trail, Reach 4 Riparian Mitigation project. The Project was executed by the City of San Jose as mitigation for impacts to riparian woodland and shaded riverine aquatic (SRA) habitat from the Los Gatos Creek Trail, Reach 4 project. Trail construction and riparian mitigation was implemented in 2007 and 2008 in accordance with the *Final Los Gatos Creek Reach 4 Trail Extension Riparian/SRA Habitat Mitigation and Monitoring Plan* (MMP; H.T. Harvey & Associates, 2004), *Plans and Specifications for Los Gatos Creek Trail Reach 4: Lincoln Avenue to Auzerais Avenue* (City of San Jose, 2005) and the *Los Gatos Creek Trail Reach 4 Riparian Mitigation Maintenance Manual* (Biotic Resources Group, 2005).

The Los Gatos Creek Trail, Reach 4 project, including mitigation and monitoring, was permitted by the following agencies: San Francisco Regional Water Quality Control Board [RWQCB; File No. 2188.07 (bkw), Site No. 02-43-C0513], California Department of Fish and Game (CDFG; Operational Law), and United States Army Corps of Engineers (299130S).

The following report summarizes the previous years' maintenance and monitoring efforts and documents the third year monitoring results and recommendations. This report includes a description of the mitigation site, monitoring methods, results, conclusions, and recommendations for the project to meet the established performance standards.

### 1.2 Mitigation Location and Description

In 2007 the City of San Jose completed construction of the Los Gatos Creek Trail, Reach 4 project by installing a paved recreational trail along Los Gatos Creek. The trail extends from Coe Avenue to Auzerais Avenue in San Jose, Santa Clara County, California. The project resulted in permanent impacts to 6,655 square feet (0.15 acre) of riparian woodlands and 34 linear feet of shaded riverine aquatic (SRA) habitat. As mitigation for these impacts, the MMP describes a 3:1 replacement ratio for native riparian woodland impacts, a 1:1 replacement ratio for non-native riparian habitat, a 0.5:1 ratio for grassland, and 3:1 ratio for SRA habitat. A total of 0.50 acre of riparian woodland, which includes 125 linear feet of SRA, was proposed as mitigation. The proposed extent exceeded the replacement ratio and was accepted by the regulatory agencies.

The RWQCB approval also required that non-native trees be replaced at a 1:1 ratio and native trees be replaced at a 3:1 ratio.

Riparian woodland and SRA restoration was implemented in January 2008 at two sites; the 0.26-acre Meridian Site (Site #1) and the 0.24-acre Auzerais Site (Site #2). The Meridian Site is located downstream and west of Meridian Avenue, north of Willow Street, east of Stokes Street and south of Curci Drive within residential San Jose (**Figures 1 and 2**). The restoration area is upslope of Los Gatos Creek and downslope of the Los Gatos Creek Trail on a very steep slope. Plantings were installed within a mix of non-native annual grassland and ruderal habitats adjacent to existing riparian woodland. The Auzerais Site is located downstream and south of Auzerais Avenue, west of Interstate 280, north of West Home Street, and east of Sunol Street in San Jose. The site is surrounded by residential and industrial development. Restoration occurred in non-native grassland habitat upslope of the Los Gatos Creek riparian woodland corridor and just east of the Los Gatos Creek Trail.

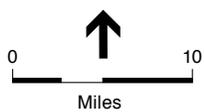
## 1.4 Mitigation Program Goals

The goal of the mitigation program is to fully compensate for biotic impacts to CDFG and RWQCB jurisdictional areas resulting from construction of Los Gatos Creek Trail, Reach 4. Compensation will be accomplished by restoration of riparian and SRA habitats adjacent to the impacted habitats. Mitigation is designed to restore self-sustaining, riparian forest dominated by native tree and shrub species by converting an area of existing non-native plant species to an area dominated by native riparian species.

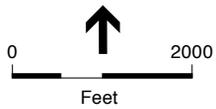
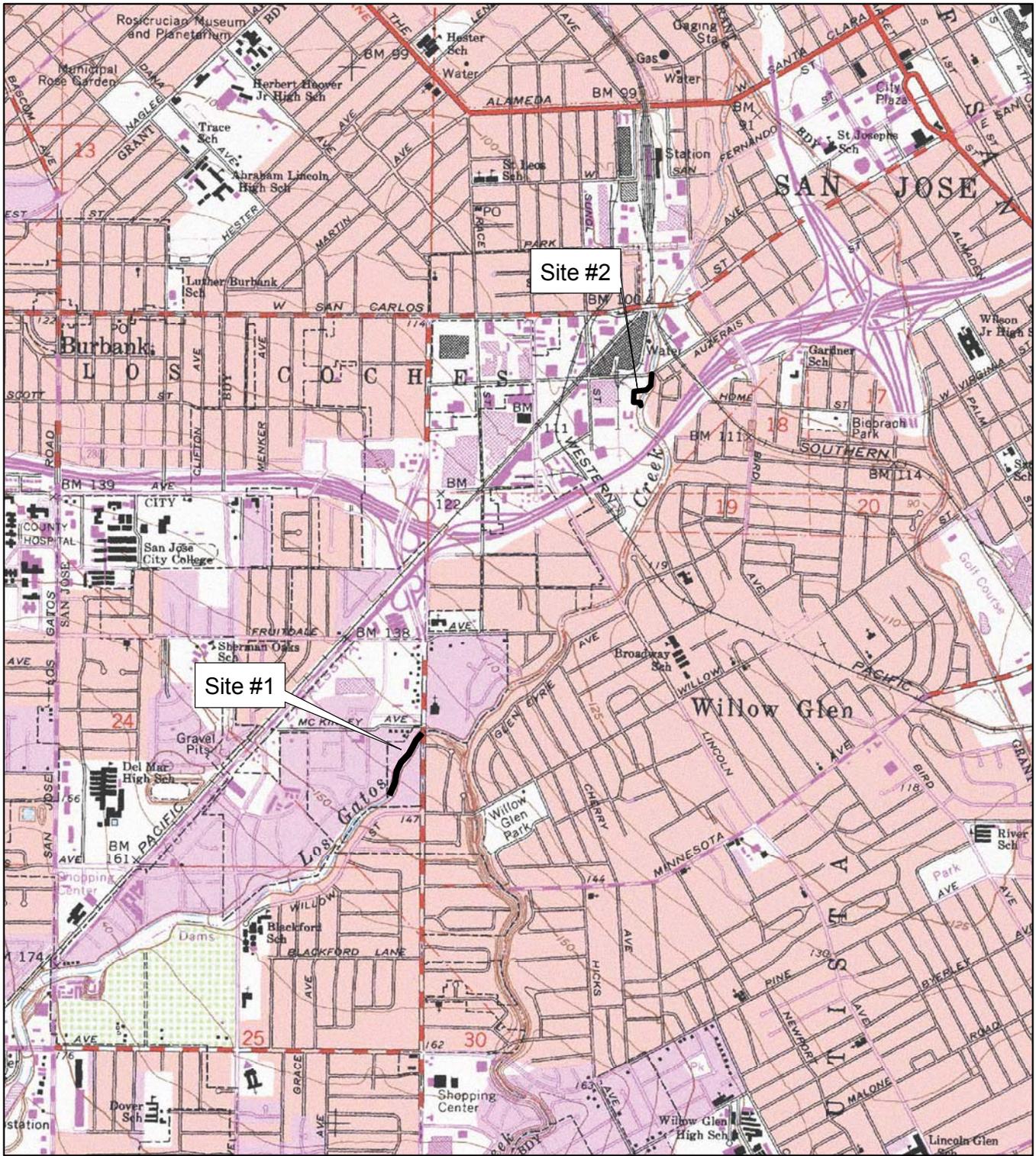
## 1.5 Monitoring Purpose

Monitoring is to be conducted annually in Years 1 through 5 and then again in years 7 and 10. The purpose of the monitoring is to:

- determine total percent survivorship for the entire installation as well as on a per species basis;
- determine percent cover for the installation as a whole and on a per species basis;
- determine the average height of each tree species;
- qualitatively assess the health and vigor of all trees and shrubs
- qualitatively evaluate site conditions (e.g., cover of native versus non-native, areas of significant die-off, areas of erosion, diseases) and make observations about necessary remedial actions (e.g., refuse removal, weed control, irrigation repairs, plant replacement); and
- photodocument the site at permanent photopoints.



Los Gatos Creek Trail Reach 4 Riparian Mitigation Project – Third Year Monitoring Report . 210011  
 SOURCE: LSA, 2009 **Figure 1**  
Regional Project Location



**Figure 2**  
 Mitigation Site Locations

## 1.5 Success Criteria

During the ten-year monitoring period the mitigation areas will be monitored and evaluated against established success criteria. **Table 1.1** details the annual and final success criteria for Years 1 through 10 as established in the MMP and the RWQCB approval. The final success criteria for this project consist of the following:

**Plant Survival.** The MMP requires that during the first three years overall plant survival shall not drop below 80%. If it does, then replanting will occur. The RWQCB approval requires that replacement plantings shall be monitored for five years from the replanting date and will be subject to the same success criteria as the original plantings. The RWQCB approval also requires that all plantings shall have a minimum of 80% survival at the end of five years.

**Percent Cover.** The Meridian Site shall have at least 50% cover of native tree and shrub plantings by Year 10. The Auzerais Site shall have at least 65% cover of native tree and shrub plantings by Year 10.

**Tree Height.** Planted trees shall reach specified tree height standards provided below in Table 1.1.

**Tree and Shrub Health and Vigor.** There are no success criteria for health and vigor. However, monitoring methods for these parameters were provided in the MMP, and were monitored in Years 1 and 2, so they should continue to be monitored.

**TABLE 1.1  
SUCCESS CRITERIA YEARS 1 THROUGH 10**

Monitoring Parameter	Year 1	Year 2	Year 3	Year 4	Year 5	Year 7	Year 10 (Final)
Percent Survival	80%	80%	80% <sup>1</sup>	80%	80%	N/A	N/A
Percent Cover Meridian Site	N/A	N/A	10%	N/A	20%	30%	50%
Percent Cover Auzerais Site	N/A	N/A	15%	N/A	30%	50%	65%
<b>Tree Height (feet)</b>							
California buckeye	N/A	N/A	4	N/A	5	7	9
valley oak	N/A	N/A	5	N/A	6	8	10
coast live oak	N/A	N/A	5	N/A	6	8	10
box elder	N/A	N/A	6	N/A	8	11	15
blue elderberry	N/A	N/A	6	N/A	8	11	14
Fremont cottonwood	N/A	N/A	7	N/A	9	12	16
black cottonwood	N/A	N/A	7	N/A	9	12	16
arroyo willow	N/A	N/A	7	N/A	9	12	16
red willow	N/A	N/A	7	N/A	9	12	16

Notes: <sup>1</sup> Replanting must occur if 80% survival is not met in Years 1 through 3.

# SECTION 2

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## Revegetation Monitoring

### 2.1 Background

#### Plant Installation 2008

All riparian woodland and SRA mitigation plantings were installed in January 2008. A total of 169 plants were installed within both planting areas, including 96 plants at the Meridian Site and 73 plants at the Auzeais Site. The Meridian Site was planted with riparian woodland species such as box elder (*Acer negundo*), coast live oak (*Quercus agrifolia*), Fremont cottonwood (*Populus fremontii*), California blackberry (*Rubus ursinus*), and willows (*Salix* sp.). The Auzeais site was planted with mixed riparian species such as box elder, coast live oak, and coyote brush (*Baccharis pilularis*). **Table 2.1** below details the number of plants installed for each species.

**TABLE 2.1  
RIPARIAN MITIGATION PLANTING LIST**

Scientific Name	Common Name	# Installed 2008
<b>Meridian Site</b>		
<i>Acer negundo</i>	box elder	3
<i>Aesculus californica</i>	California buckeye	11
<i>Artemisia douglasiana</i>	mugwort	8
<i>Populus fremontii</i>	Fremont cottonwood	11
<i>Prunus ilicifolia</i>	holly-leaved cherry	11
<i>Quercus agrifolia</i>	coast live oak	5
<i>Rubus ursinus</i>	California blackberry	21
<i>Salix</i> sp.	willows	20
<i>Sambucus mexicana</i>	blue elderberry	6
<b>Meridian Total</b>		<b>96</b>
<b>Auzeais Site</b>		
<i>Acer negundo</i>	box elder	7
<i>Aesculus californica</i>	California buckeye	9
<i>Baccharis pilularis</i>	coyote brush	13
<i>Prunus ilicifolia</i>	holly-leaved cherry	11
<i>Quercus agrifolia</i>	coast live oak	19
<i>Sambucus mexicana</i>	blue elderberry	14
<b>Auzeais Total</b>		<b>73</b>
<b>Total from Both Sites</b>		<b>169</b>

All plants were installed with above and below ground browse protection and were mulched. DRiWATER® gel packs were installed with each plant in the Meridian Site and the Auzerais plants were hand-watered.

## Maintenance Activities 2008

Central Coast Wilds implemented the site maintenance from January through October 2008. Their work included non-native invasive species removal, general weed control, providing supplemental gel packs to the Meridian Site, hand-watering of the Auzerais Site, and trash removal.

## Maintenance Activities 2009

The City of San Jose Parks Department was responsible for site maintenance in 2009. They performed weed control, mowing, and hand-watering at the Auzerais Site. They conducted mowing and weed removal in the spring and early summer and hand watered eight times during the dry season.

The City Parks Department contracted Central Coast Wilds to conduct weed maintenance and provide supplemental irrigation to the Meridian Site. They conducted weed-whipping and weed removal in July and November and recharged irrigation gel packs in July and October.

## Maintenance Activities 2010

The City of San Jose Parks Department contracted Central Coast Wilds (through ESA) to conduct site maintenance at both sites in August, 2010. At the Meridian Site they performed weed-whipping and invasive species removal and recharged irrigation gel packs. At the Auzerais site they performed weed-whipping and invasive species removal and hand-watered the planting area monthly during the dry season.

## 2.2 Methods

This is the third year of monitoring and the methods implemented followed the methods established in the MMP, as summarized below.

### General Site Conditions

The general condition of each planting site was qualitatively evaluated for the presence of native species recruits, invasive species, erosion, vandalism, animal damage, etc.

## Percent Survival

All surviving trees and shrubs were counted and tallied per species and per mitigation site. Percent survival was then calculated by dividing the total number of surviving plants by the total number installed, then multiplying by 100.

## Percent Cover

Percent cover was measured in Year 2 and 3 using the line-intercept method at two transects per site, as specified in the MMP. The same two transects per site were monitored in Year 1, although the point-intercept method was used that year. Subsequent monitoring will use the line-intercept method for consistency and more reliable comparisons of annual data. The locations of the Meridian Site transects are shown on **Figure 3** and the Auzerais transects are shown on **Figure 4**.

This year, both ends of each transect were marked with wooden stakes labeled with their respective transect numbers. The beginning and end point of each transect was recorded using a Trimble GeoXT Global Positioning System (GPS) with sub-meter accuracy.

To measure percent cover, a measuring tape was extended between the start and end point of each transect. The distance that the crown of each plant intercepted the measuring tape was recorded in the field. This data was later entered into Microsoft Excel and total cover for each species was determined by summing each intercept for that species, dividing the sum by the length of the transect, and multiplying that result by 100.

## Tree Height

The height of each tree and shrub was measured using a graduated rod. There are no success criteria for shrub height, but both tree and shrub heights were measured during the previous two monitoring efforts, so they should continue to be monitored to provide a comparison, and to determine whether the trend for height continues to increase.

## Tree and Shrub Health and Vigor

Each living plant was given a value (1 through 9) for both health and vigor based on the rating provided in **Table 2.2**. For example, a plant that had 100% healthy foliage would be given a health/vigor value of 1.

**TABLE 2.2**  
**NUMERICAL VALUES FOR ASSESSING PLANT HEALTH AND VIGOR**

Value	Health/Vigor	Observations
1 – 3	High health and vigor	67 – 100% healthy foliage
4 – 6	Medium health and vigor	34 – 66% healthy foliage
7 – 9	Low health and vigor	0 – 33% healthy foliage





## Photomonitoring

Permanent photo points were established at the mitigation site during the first monitoring year. Two photo points were established at each planting site, their locations are depicted on Figures 3 and 4. **Appendix B** includes representative photographs from each photo point from Years 1 through 3.

Photos were also taken of each transect this year. The location, vantage point, and proximity to each transect are not consistent throughout the mitigation sites because the function of these photos is transect relocation. These photos are not included in the photo appendix but are available upon request.

## **SECTION 3**

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### **Results**

On September 22, 2010, ESA conducted the annual mitigation monitoring of the Los Gatos Creek Trail, Reach 4 Mitigation Sites. This was the third year of monitoring following planting in January 2008. The following section describes the current site conditions, a general summary of the results from the previous two years of monitoring, and the results from this year.

#### **3.1 General Site Conditions**

The Meridian site is located on an extremely steep slope above a narrow riparian corridor and adjacent to oak woodland habitat. Despite the steep gradient, the slope is well covered with vegetation (both native and non-native) and there is little erosion present. Recent monthly maintenance has kept invasive species cover low. The surviving container stock plants are irrigated with DRiWATER®; planting basins are checked regularly and gel packs replaced when dry.

The Auzerais site is located on a gentle slope above a dense oak riparian corridor and erosion is absent from the site. Plantings are hand-watered during the dry months and recent weeding has reduced competition from invasive species and non-native grasses. Recently an approximately 1.5-foot deep layer of mulch was placed over the southern portion of the planting area, burying some of the container plants and the majority of perennial grasses that had successfully established at the site.

#### **3.2 Year 1 and 2 Monitoring**

##### **Year 1**

The first year annual monitoring was conducted on October 8 and 15, 2008 by Biotic Resources Group (Biotic Resources Group, 2008). The monitoring methods used varied slightly from those established in the MMP, the methods used in Year 2 and those used this year. The number of surviving cottonwoods and willows were not counted, the point-intercept method was used instead of the line-intercept method to measure percent cover, and a different health and vigor rating system was used to evaluate the condition of surviving plants. Even though the methods

were different, the results can still be used to compare the site's success throughout monitoring years.

In Year 1 survivorship at both sites was high; the Meridian site had 91% survival (excluding cottonwoods and willows) and the Auzerais site had 96% survival. Holly-leaved cherry was the only species at both sites to have low survival. Nearly all of the surviving trees and shrubs were given high vigor and health ratings. Plant cover at both sites was very high for the first year of monitoring. The Meridian site had an average 17% cover of planted trees and shrubs, while the Auzerais site had an average 25% cover.

## Year 2

The second year annual monitoring was conducted in April and October 2009 by LSA Associates (LSA, 2009). Monitoring methods followed those outlined in the MMP and implemented this year. Plant survival was below performance standards at both sites. The Meridian site only had 54% survival due to the loss of all cottonwoods and most of the willows. The Auzerias site had 78% survival. Coast live oak and holly-leaved cherry suffered the highest mortality at this site. Most of the surviving trees and shrubs at both sites were healthy and vigorous. Plant cover at the Meridian site was 6% and cover at the Auzerais site was 5%. Both sites decreased in cover since Year 1.

### 3.3 Third Year Monitoring Results

#### Percent Survival

Overall survival at both sites is 54%, which is a decrease from 64% survival last year and 93% in the first year. Most loss this year was at the Meridian site, which only had 43% survival, while the Auzerais Site had 68% survival. **Table 3.1** below details the percent survival of each species planted at each site over the last three monitoring years.

The only two species at the Meridian site to have greater than 80% survival since installation are coast live oak (*Quercus agrifolia*) and mugwort (*Artemisia douglasiana*); both species have continued to have 100% survival all three years. All other species have steadily declined and lost between 30% and 100% of installed plants since Year 1. The most significant loss was from cottonwoods, buckeyes, and willows, which respectively lost 100%, 92%, and 70% of installed plants.

Coyote brush and blue elderberry are the only two species at the Auzerais site to have greater than 80% survival. The remaining species have between 43% and 65% survival. Box elder and holly-leaved cherry had the greatest losses with 43% and 45% survival respectively.

**TABLE 3.1  
PLANT SURVIVAL YEARS 1 THROUGH 3**

Plant Species Common Name	# Installed 2008	# Alive 2008 (Year 1) <sup>1</sup>	Percent Survival 2008 (Year 1)	# Alive 2009 (Year 2) <sup>2</sup>	Percent Survival 2009 (Year 2)	# Alive 2010 (Year 3)	Percent Survival 2010 (Year 3)
<b>Meridian Site</b>							
box elder	3	3	100%	3	100%	2	67%
California buckeye	11	11	100%	7	64%	2	18%
Mugwort	8	8	100%	8	100%	8	100%
Fremont cottonwood	11	N/A	N/A	0	0%	0	0%
holly-leaved cherry	11	7	64%	8	73%	5	45%
coast live oak	5	5	100%	5	100%	5	100%
California blackberry	21	20	88%	11	52%	6	30%
Willows	20	N/A	N/A	6	30%	8	40%
blue elderberry	6	5	93%	4	67%	4	67%
<b>Meridian Site Total</b>	<b>96</b>	<b>59</b>	<b>91%</b> <sup>3</sup>	<b>52</b>	<b>54%</b>	<b>40</b>	<b>43%</b>
<b>Auzerais Site</b>							
box elder	7	7	100%	7	100%	3	43%
California buckeye	9	9	100%	7	78%	6	67%
coyote brush	13	13	100%	13	100%	13	100%
holly-leaved cherry	11	8	63%	6	55%	5	45%
coast live oak	19	19	100%	10	53%	11	58%
blue elderberry	14	14	100%	14	100%	12	86%
<b>Auzerais Site Total</b>	<b>73</b>	<b>70</b>	<b>96%</b>	<b>57</b>	<b>78%</b>	<b>50</b>	<b>68%</b>
<b>Total Both Sites</b>	<b>169</b>	<b>129</b>	<b>93%</b> <sup>4</sup>	<b>109</b>	<b>64%</b>	<b>90</b>	<b>54%</b>

Notes:<sup>1</sup> Biotic Resources Group, 2008

<sup>2</sup> LSA Associates, 2009

<sup>3</sup> Cottonwoods and willows were not counted in 2008. Percent survival is based on the total number counted (59) divided by the total number planted not including cottonwoods or willows (65) then multiplied by 100.

<sup>4</sup> Cottonwoods and willows were not counted in 2008. Percent survival is based on the total number counted (129) divided by the total number planted not including willows (138) multiplied by 100.

## Percent Cover

Results from the third year of monitoring for percent cover at the Meridian site are presented in **Table 3.2** and for the Auzerais site in **Table 3.3**. **Table 3.4** provides a comparison of percent cover at both sites over the last three years.

The average cover of planted woody species at the Meridian Site is 8%, which is just under the 10% performance standard for the third year. This is an increase from 6% cover in Year 2, but an overall decrease from 17% cover in Year 1. The average cover of planted woody species at the Auzerais site is 12.7%, which is also just below the 15% performance standard for the third year. Cover at this site has increased dramatically from 5% in Year 2, although is still an overall decrease from 25% cover in Year 1. Year 1 results are not directly comparable to Year 2 and Year 3 since different monitoring methods were used, but are helpful to discuss general trends.

At both sites this year, invasive species were absent from all four transects, due to monthly weed maintenance of the site.

**TABLE 3.2**  
**LOS GATOS CREEK TRAIL SITE #1 (MERIDIAN) PLANT COVER**

Scientific Name	Common Name	Percent Cover per Species by Transect		Average Percent Plant Cover
		Transect 1	Transect 2	All
<i>Acer negundo</i>	box elder			0
<i>Aesculus californica</i>	California buckeye	0.7		0.4
<i>Artemisia douglasiana</i>	mugwort	1.8		0.9
<i>Populus fremontii</i>	Fremont cottonwood			0
<i>Prunus ilicifolia</i>	holly-leaved cherry	3.1		1.6
<i>Quercus agrifolia</i>	coast live oak		5.7	2.9
<i>Rubus ursinus</i>	California blackberry		0.4	0.2
<i>Salix sp.</i>	willows			0
<i>Sambucus mexicana</i>	blue elderberry		3.9	2.0
<b>Total Planted Woody Species Cover</b>		<b>5.6</b>	<b>10.0</b>	<b>8.0</b>
<b>Invasive Non-Native Species Cover</b>		<b>0</b>	<b>0</b>	<b>0</b>

**TABLE 3.3**  
**LOS GATOS CREEK TRAIL SITE #2 (AUZERAIS) PLANT COVER**

Scientific Name	Common Name	Percent Cover per Species by Transect		Average Percent Plant Cover
		Transect 1	Transect 2	All
<i>Acer negundo</i>	box elder		0.2	0.1
<i>Aesculus californica</i>	California buckeye			0
<i>Baccharis pilularis</i>	coyote brush		6.3	3.2
<i>Prunus ilicifolia</i>	holly-leaved cherry			0
<i>Quercus agrifolia</i>	coast live oak	9.2	4.2	6.7
<i>Sambucus mexicana</i>	blue elderberry	5.4		2.7
<b>Total Planted Woody Species Cover</b>		<b>14.6</b>	<b>10.7</b>	<b>12.7</b>
<b>Invasive Non-Native Species Cover</b>		<b>0</b>	<b>0</b>	<b>0</b>

**TABLE 3.4**  
**PERCENT COVER WOODY SPECIES YEARS 1 THROUGH 3**

Site (Restored Habitat Type)	Average Percent Cover Woody Species Year 1 (2008) <sup>1</sup>	Average Percent Cover Woody Species Year 2 (2009) <sup>2</sup>	Average Percent Cover Woody Species Year 3 (2010)	Year 3 Percent Cover Woody Species Performance Standard
Meridian Site (Riparian Woodland Association)	17%	6%	8%	10%
Auzerais Site (Mixed Riparian Association)	25%	5%	12.7%	15%

Notes: <sup>1</sup> Biotic Resources Group, 2008. In 2008, the point-intercept method was used to measure percent cover, while the line-intercept method was used in all subsequent monitoring years.

<sup>2</sup> LSA Associates, 2009

## Height

**Table 3.5** shows the average height of each tree species at each site over the past three years as well as their Year 3 performance standards.

**TABLE 3.5**  
**AVERAGE PLANT HEIGHT YEARS 1 THROUGH 3**

Plant Species Common Name	Average Height in Feet Year 1 (2008) <sup>1</sup>	Average Height in Feet Year 2 (2009) <sup>2</sup>	Average Height in Feet Year 3 (2010)	Year 3 Height Performance Standard (feet)
<b>Meridian Site</b>				
box elder	2.4	6.3	<b>8</b> <sup>3</sup>	6
California buckeye	1.6	2.1	2.8	4
mugwort	2.8	2.0	2.5	N/A
Fremont cottonwood	2.4	N/A	N/A	7
holly-leaved cherry	1.8	2.3	3.2	N/A
coast live oak	1.7	2.8	4	5
California blackberry	1.2	0.9	1.6	N/A
willows	2.4	10.0	<b>9</b>	7
blue elderberry	3.5	6.3	<b>6.4</b>	6
<b>Auzerais Site</b>				
box elder	3.7	4.0	3.8	6
California buckeye	2.3	2.6	2.5	4
coyote brush	3.1	3.8	6.6	N/A
holly-leaved cherry	1.1	1.2	2.7	N/A
coast live oak	2.7	2.9	3.4	5
blue elderberry	2.5	2.7	4.5	6

Notes: <sup>1</sup> Biotic Resources Group, 2008

<sup>2</sup> LSA Associates, 2009

<sup>3</sup> Bold font highlights when a performance standard has been met.

At the Meridian Site three of the six tree species (box elder, willow, and blue elderberry) are meeting the Year 3 height performance standard, while at the Auzeais Site, only box elder is meeting the height performance standard. However, the average height of nearly all species has increased since 2009 at both sites. Average willow height at the Meridian site and box elder and California buckeye height at the Auzeais site have decreased since 2009, but this is likely due to mortality of taller plants.

## Health and Vigor

**Table 3.6** includes the average health/vigor rating from 2009 and 2010. Year 1 results are not included since a different rating system was used and can not be compared numerically to the Year 2 and 3 results. There are no final performance standards for health and vigor; these parameters are measured annually to evaluate changes in plant condition.

**TABLE 3.6**  
**AVERAGE PLANT HEALTH AND VIGOR YEARS 2 AND 3<sup>1</sup>**

Plant Species Common Name	Average Health/Vigor Rating Year 2 (2009) <sup>2</sup>	Average Health/Vigor Rating Year 3 (2010)
<b>Meridian Site</b>		
box elder	2.7	2
California buckeye	3.4	3.5
mugwort	3.0	4.1
Fremont cottonwood	N/A	N/A
holly-leaved cherry	1.3	2.6
coast live oak	1.4	1.8
California blackberry	3.5	3
willows	2.0	1
<b>Auzeais Site</b>		
blue elderberry	2.0	3.5
box elder	2.4	4.3
California buckeye	3.5	3
coyote brush	1.9	1.7
holly-leaved cherry	4.0	1.8
coast live oak	2.7	1.7
blue elderberry	2.6	3.6

Notes: <sup>1</sup> 2008 monitoring followed a different rating method than described in the MMP, so is not applicable for comparison

<sup>2</sup> LSA Associates, 2009

Table 2.2 details the numerical values for assessing plant health and vigor. The average health/vigor rating of each species at the Meridian site ranged between 4.1 and 1, which translates into a range from “medium” to “high” health and vigor. Approximately half of the species have increased in health and vigor since last year, while the other half have decreased. However the

differences in values between Year 2 and 3 are not dramatic and may simply be due to observer bias in applying this subjective measure.

Results were similar at the Auzeais site with average ratings ranging from 4.3 to 1.7. Four of the seven species have increased in average health/vigor since Year 2 and three have decreased, although again, the differences are not substantial.

## SECTION 4

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# Conclusion and Recommendations

### 4.1 Conclusion

Neither the Meridian nor Auzeais sites are meeting their Year 3 performance standards for percent survival, percent cover, and tree height. Percent survival has declined each year since Year 1 and remains beneath the MMP required 80% survival for the first three years. Year 3 results do show improvements in percent cover and tree height since last year. Infrequent maintenance of the site allowed increased cover and competition from invasive species and non-native annual grasses. Recent monthly maintenance of the site before the September 2010 monitoring resulted in little to no cover of invasive species within each transect. The surviving trees and shrubs have averaged an increase in height and their health and vigor have generally remained unchanged since 2009.

Frequent maintenance should continue at both sites to ensure survival and growth of installed plants. Additional recommendations to increase the overall performance of the site are provided in the following section.

### 4.2 Recommendations

Based on the generally low survival rate, tree height, and percent cover, ESA recommends the following maintenance measures be implemented to ensure the Los Gatos Creek Trail, Reach 4 site meets its permit conditions and final success criteria.

#### Meridian Site

The following maintenance activities should be implemented at the Meridian site:

- **Plant replacement.** The Meridian Site has not met its 80% survival rate performance standard. The MMP, approved by the permitting agencies, states that if plant survival falls below 80% within the first three years of monitoring, then replanting shall occur. ESA recommends replanting the following quantities to exceed the 80% survival rate:
  - 5 California buckeye
  - 5 Fremont cottonwood
  - 15 California blackberry

- 15 willows
  - 5 holly-leaved cherry
  - 2 elderberry
- **Plant installation.** Fremont cottonwoods should be installed approximately 4 feet above the Ordinary High Water (OHW) line and willows should be installed at the OHW line.
  - **Irrigation.** DRiWATER® should be installed at every new planting basin, with the exception of the willows installed at the OHW line. Gel packs should continue to be recharged at the planting basins of surviving plants.
  - **Weed maintenance.** The recent monthly weed maintenance has proved successful at decreasing non-native invasive weed cover and should continue. This includes weed whipping, hand pulling and any other methods necessary to control invasive species such as fennel, mustard, and wild radish and competing annual grasses within the planting area.
  - **Plant maintenance.** As part of monthly maintenance activities, any cages where plants are beginning to exceed the capacity of the cage should be removed.

## Auzerais Site

The following maintenance activities should be implemented at the Auzerais site:

- **Plant replacement.** The Auzerais site is also below the 80% survival performance standard. To exceed 80 % survival, ESA recommends planting the following quantities:
  - 3 California buckeye
  - 5 coast live oak
  - 4 holly-leaved cherry
- **Irrigation.** Drip irrigation or DRiWATER® should be installed at each new planting basin. Surviving plants from the original installation should continue to be hand-watered on an as needed basis during monthly site maintenance.
- **Site maintenance.** The mulch that has been placed over part of the site should be removed and/or spread over the entire site so it is not as thick.
- **Weed maintenance.** The recent monthly weed maintenance has proved successful at decreasing non-native invasive weed cover and should continue. This includes weed whipping, hand pulling and any other methods necessary to control invasive species and competing annuals within the planting area.

- **Plant maintenance.** As part of monthly maintenance activities, any cages where plants are beginning to exceed the capacity of the cage should be removed.

## SECTION 5

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# Report Preparation and References

### 5.1 Report Preparation

Prepared by: Michelle Giolli, Field Biologist  
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Other contributors: Martha Lowe, Project Biologist and Deputy Project Manager  
Chris Rogers, Project Manager  
Perry Jung, Graphics

### 5.2 References

Biotic Resources Group, 2005. *Los Gatos Creek Trail Reach 4 Riparian Mitigation Maintenance Manual*. Soquel, California. December 12.

Biotic Resources Group, 2008. *Los Gatos Creek Trail Reach 4 Riparian Mitigation Year 1 (2008) Monitoring Report*. Prepared for the City of San Jose Department of Public Works and David Powers & Associates. Soquel, California. December 2.

City of San Jose, 2005. Plans and Specifications for Los Gatos Creek Trail Reach 4: Lincoln Avenue to Auzerais Avenue.

H.T. Harvey & Associates, 2004. *Final Los Gatos Creek Reach 4 Trail Extension Riparian/SRA Habitat Mitigation and Monitoring Plan*. Prepared for David J. Powers & Associates. Los Gatos, California. September 14.

LSA Associates, 2009. *Los Gatos Creek Trail Reach 4 Riparian Mitigation Project Year 2 (2009) Monitoring Report*. Prepared by for the City of San Jose Department of Parks, Recreation and Neighborhood Services. Point Richmond, California. December 17.

# **APPENDIX A**

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## Monitoring Data Sheets







Los Gratos Creek, Meridian  
Happy Hollow Cover (Line Intercept) Datasheet

grass: avenue  
mudflat  
unk. grass  
radish  
mustard

Date: 9/22/10 Surveyors: M. G. ... Transect Number: T-1 END 37°18'21.2087"N  
Time: 1:10 Weather Conditions: Clear Transect Length: 32 m 121°54'54.1731"W  
WAVEN AS 70 Transect Coordinates/Notes: Start 37°18'27.0713"N  
PPA MER (start) 121°54'53.3419"W

Species Code	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop	Start	Stop
grass	0	7.1										
PRIL	7.1	7.5										
grass	7.5	9.05										
bark	9.05	9.74										
grass	9.74	11.6										
PRIL	11.57	11.61										
ARDO	12.77	13.35										
grass	11.9	12.9										
grass	13.5	27.7										
bark	22.7	23.25										
AECA	22.78	23.01										
grass	23.25	25.7										
PRIL	25.84	26.03										
grass	26.4	31.1										
bark	31.1	32										
PRIL	31.32	31.67										

- (box elder) Acer negundo: ACNE
- (mugwort) Artemisia douglasiana: ARDO
- (coyote brush) Baccharis pilularis: BAPI
- (toyon) Heteromeles arbutifolia: HEAR
- (Sycamore) Platanus racemosa: PLRA
- (Fremont cottonwood) Populus fremontii: POFR
- (coast live oak) Quercus agrifolia: QEAG
- (valley oak) Quercus lobata: QULO

- (coffeeberry) Rhamnus californica: RHCA
- (gooseberry) Ribes californica: RICA
- (CA rose) Rosa californica: ROCA
- (willow) Salix spp.: SASP
- (elderberry) Sambucus mexicana: SAME
- (figwort) Scrophularia californica: SCCA
- (snowberry) Symphoricarpos albus: SYAL



Los Gatos Creek Trail Tree and Shrub Survival and Health Data Sheet

Date: 9/27/10 Surveyors: M. G. ... L. Professor

Site: Meridian or Auzeirais (circle one)

Time: \_\_\_\_\_ Weather Conditions: \_\_\_\_\_

Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)	Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)
QUAG	4.2	2			UNK	Dead		empty cage	
UNK		9		dead/cage empty	SAME	8.5	4		
BAP1					RUR	Dead in cage			
UNK		9		dead/cage empty	SAME	6.6	3		
UNK		9		dead cage empty	RUR	Dead in cage			
UNK		1		dead cage empty	UNK.	Dead in cage			
QUAG	2.8	2			RUR	1.6	3		
RUR	1.6	3			SAME	1.5	2		Tall but on side
RUR	2.2	3			RUR	1.4	1		
RUR	1.5	4			UNK	Dead empty cage			
QUAG	4.4	2			UNK	dead	9		empty cage
ARDO	2.1	2			UNK	dead	9		"
AECA	3.2	4			UNK	Dead	9		"
UNK		9		dead/cage empty	UNK	dead	9		"
UNK		9		"	PRIL	5.8	2		
SAME	9.0	5			PRIL	1.0	5		

Area near T-2

H.M. Billberg  
 5-10-93 (use)

- Some (10%) purchased from AR / 1V4  
 N8 willows  
 could be volunteers  
 6-12"  
 all healthy = 1  
 Several willows stakes all dead

Los Gatos Creek Trail Tree and Shrub Survival and Health Data Sheet

Date: 9/22/10 Surveyors: M. Stahl  
 Site: Meridian or Auzerais (circle one)  
 Time: Weather Conditions:

Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)	Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)
QUAG	3.9	2							
RUVZ	dead	9	0						
PRIL	3.8	2							
UNK	dead	9		cage empty					
UNK	dead	9		"					
UNK	dead	9		"					
ARDO	1.5	2							
RUVZ	1.1	4							
UNK	dead	9		cage empty					
QUAG	4.6	1							
UNK	dead	9		empty cage					
UNK	"	9		"					
UNK	"	9		"					
ACNE	6.0	2							
UNK	dead								
ACNE	10	2							

Los Gatos Creek Trail Tree and Shrub Survival and Health Data Sheet

Date: 9/15/10 Surveyors: L. JOHNSON, M. GIBB Site: Meridian or Auzerais (circle one)

Time: 1:20 Weather Conditions: Partly

Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)	Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)
PRIL	3.1	2			ARDO	2.7	4		
LINK		9		gone Cage empty	ARDO	2.5	7		
PRIL	2.4	2			AECA	4.2	5		
ARDO	2.9	3			PRIL	2.9	3		
ARDO	2.3	6			PRIL	1.3	2		
LINK				cage empty	PRIL	1.5	2		
ARDO	2.4	5							
ARDO	2.9	4							
ARDO	2.8	8							
AECA	2.3	3							
ARDO	3.2	3		all outside cage					

Value	Health/Vigor	Observations
1-3	High health and vigor	67-100% healthy foliage
4-6	Medium health and vigor	34-66% healthy foliage
7-9	Low health and vigor	0-33% healthy foliage

- (box elder) Acer negundo: ACNE
- (CA buckeye) Aesculus californica: AECA
- (mugwort) Artemisia douglasiana: ARDO
- (coyote brush) Baccharis pilularis: BAPI
- (Fremont cottonwood) Populus fremontii: POFR
- (holly-leaved cherry) Prunus ilicifolia: PRIL
- (coast live oak) Quercus agrifolia: QEAG
- (CA blackberry) Rubus ursinus: RUUR
- (willow) Salix spp.: SASP
- (elderberry) Sambucus mexicana: SAME

Area of T-1

Los Gatos Creek Trail Tree and Shrub Survival and Health Data Sheet

Date: 9/22/10 Surveyors: M. Gioia, L. Thompson

Site: Meridian or Auzerais (circle one)

Time: 12:30 Weather Conditions: partly cloudy, breeze, sunny

Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)	Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)
QUAG	2.8	2			unknown		9		dead in cage
QUAG	3.5	2			AECA	2.2	3		all leaves dead / seasonal? some left buds
SAME	5.8	3			QUAG	8.7	2		
QUAG	6.1	1			AECA	2.4	3		all leaves dead / seasonal? some live buds
SAME	5.3	2			AECA	3	3		some leaves? seasonal?
SAME	3.6	5			SAME	3.6	9		dead, no leaves, no live buds
PRIL	0.6	7		very small	SAME	7	2		
missing				has cage	QUAG	2.8	2		
missing				has cage	BAP1	5.4	1		
QUAG	2.1	2			BAP1	6.9	1		
PRIL		9		dead	unk		9		dead / w/ cage

Value	Health/Vigor	Observations
1-3	High health and vigor	67-100% healthy foliage
4-6	Medium health and vigor	34-66% healthy foliage
7-9	Low health and vigor	0-33% healthy foliage

- (box elder) Acer negundo: ACNE
- (CA blackberry) Rubus ursinus: RUUR
- (CA buckeye) Aesculus californica: AECA
- (willow) Salix spp.: SASP
- (mugwort) Artemisia douglasiana: ARDO
- (elderberry) Sambucus mexicana: SAME
- (coyote brush) Baccharis pilularis: BAP1
- (Fremont cottonwood) Populus fremontii: POFR
- (holly-leaved cherry) Prunus ilicifolia: PRIL
- (coast live oak) Quercus agrifolia: QEAG

Los Gatos Creek Trail Tree and Shrub Survival and Health Data Sheet

Date: 9/22/15 Surveyors: Unidentified L. Dawson Site: Meridian or Auzerats (circle one)

Time: \_\_\_\_\_ Weather Conditions: \_\_\_\_\_

Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)	Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)
UNK		9		gone was cage	SAME	6.5	2		
QUAG	3.8	1			ACNE	3.9	3		
BAP1	5.6	3			BAP1	8'	1		
QUAG	3.5	2			ACNE	4.3	8		
UNK		9		dead/was cage	SAME	2.5	6		
BAP1	4.6	1			PRIL	2.9	2		
SAME	4.8	4			PRIL	1.5	2		
QUAG	3.8	1			ACNE		9		dead / was cage
QUAG		9		dead/was cage	ACNE		9		dead / was cage
SAME		9		dead/was cage	PRIL	0.9	2		
QUAG	4.3	2			BAP1	6.6	2		
BAP1	6.8	2			BAP1	6.5	4		
ACNE	3.2	2			UNK		5		head was cage
BAP1	6.3	2			UNK		9		gone was cage
SAME	2.1	3		Surrounding mulch <sup>with</sup> gone	UNK		9		gone was cage
SAME	6.2	2			PRIL		9		dead / was cage
					QUAG		9		dead / was cage

Los Gatos Creek Trail Tree and Shrub Survival and Health Data Sheet

Date: 9/22/10 Surveyors: M. Grant, L. Johnson

Site: Meridian or Auzerais (circle one)

Time: Weather Conditions:

Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)	Planted Species	Height (trees)	Health Code	Vigor Code	Comments (volunteer?)
PRIL	2.4	1			SAME	2.6	2		
BAPI	7.8	2			une/same?	9			dead/loss age
BAPI	7.7	1			QUAG	3	2		
AELX	2.2	3		10% buds					
BAPI	6.8	1							
AELX	3	3							
AELX	2.1	3							
BAPI	6.3	1							
QUAG		9		dead/loss age					
SAME	3.8	3							
SAME? UNL		9		dead/loss age					

Value	Health/Vigor	Observations
1-3	High health and vigor	67-100% healthy foliage
4-6	Medium health and vigor	34-66% healthy foliage
7-9	Low health and vigor	0-33% healthy foliage

- (box elder) Acer negundo: ACNE
- (CA buckeye) Aesculus californica: AECA
- (mugwort) Artemisia douglasiana: ARDO
- (coyote brush) Baccharis pilularis: BAPI
- (Fremont cottonwood) Populus fremontii: POFR
- (holly-leaved cherry) Prunus ilicifolia: PRIL
- (coast live oak) Quercus agrifolia: QEAG
- (CA blackberry) Rubus ursinus: RUUR
- (willow) Salix spp.: SASP
- (elderberry) Sambucus mexicana: SAME

# **APPENDIX B**

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## Photodocumentation





Photo 1: Meridian Site  
from Photo Point A,  
September 2010.



Photo 2: Meridian Site  
from Photo Point A,  
October 2009.



Photo 3: Meridian Site  
from Photo Point A,  
October 2008.



Photo 4: Meridian Site  
from Photo Point B,  
September 2010.



Photo 5: Meridian Site  
from Photo Point B,  
October 2009.



Photo 6: Meridian Site  
from Photo Point B,  
October 2008.



Photo 7: Auzerais Site from Photo Point A, September 2010.



Photo 8: Auzerais Site from Photo Point A, April 2009.



Photo 9: Auzerais Site from Photo Point A, October 2008.



Photo 10: Auzerais Site  
from Photo Point B,  
September 2010.



Photo 11: Auzerais Site  
from Photo Point B,  
April 2009.



Photo 12: Auzerais Site  
from Photo Point B,  
October 2008.