Baseline (Year 1)
Habitat Monitoring Report
Village Creek Restoration Project
(University Village Albany Step 2, #12810A)
University of California, Berkeley

Prepared for:
University of California, Berkeley Capital Projects
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January 2008

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1.0 EXECUTIVE SUMMARY

This report documents the baseline (Year 1) monitoring for the University of California, Berkeley's Village Creek restoration project located in Albany, California. The project is located near the University of California, Berkeley's University Village student housing complex located at 1125 Jackson Street in Albany California, bounded on the east by San Pablo Avenue, on the north by Buchanan Street, on the south by Harrison Street, and on the west by the Union Pacific Railroad tracks (Figure 1). The Creek Day-lighting project area encompasses 22,500 square feet of restored creel channel (approximately 0.52 acres).

The project is subject to the following environmental permits and agreements:

- California Regional Water Quality Control Board, Water Quality Certification (File No. 2198.11);
- U.S. Army Corps of Engineers Section 404 Clean Water Act, Nationwide Permit 7 (File No. 29071S); and
- Department of Fish and Game, Lake and Streambed Alteration Agreement (Notification No. 1600-2004-0664-3).

These permits and agreements require UC Berkeley to conduct plantings described above, in conformance to Village Creek Planting Sheet L7.02, included in the construction design drawings dated September 9, 2004 (Figure 2). The creek restoration site was graded and irrigation installed in September and early October 2007. The site was planted in early October 2007, with plantings completed by October 10, 2007 (T. Nowack, pers. comm.). Restoration plantings included tree and shrub planting and hydroseeding, as described in project design drawings and specifications.

The following performance criteria were established for the project:

> "All plantings shall have a minimum of 80% survival at the end of 5 years and shrubs shall attain 70% cover after 3 years and 75% cover after 5 years. If the… (*Sic* project is not attaining) …the stated percentage survival and/or cover requirements, the Applicant is responsible for replacement plantings, additional watering, weeding, invasive exotic eradication, or any other practice, to achieve these performance goals. Replacement plantings shall be monitored with the same percents survival and growth requirements for five years after planting as the original plantings."

Following plant installation, a 5 year monitoring and plant maintenance program is required by project permits to help ensure the project is successful. To meet this project requirement, baseline monitoring was performed by Loran May, President and Senior Botanist with May & Associates on January 4, 2008.

In summary, the site was planted in accordance with approved design drawings and specifications. The site was also hydroseeded with a seed mixture that was approved by the University of California, Berkeley. Overall, hydroseeded areas had good grass and forb establishment, estimated at 85-90% vegetative cover at the time of the January 2008 site survey. The baseline Year 1 observed vegetation cover exceeds Year 3 and 5 performance standards for the project. The baseline Year 1 observed plant height is within the acceptable range at this time for the project.

Baseline Year 1 survivorship standards were also met, however, some minor remedial plantings are recommended to help ensure the project stays on track to meet Year 5 performance standards for this monitoring parameter, as described in Section 5.0 below (Figure 3).

2.0 INTRODUCTION

This report documents the baseline (Year 1) vegetation monitoring for the University of California, Berkeley's Village Creek restoration project located in Albany, California. The Creek Day-lighting project area encompasses approximately 750 linear feet of Village Creek that used to run through a culvert.

2.1 Project Location

The project is located near the University of California, Berkeley's University Village student housing complex located at 1125 Jackson Street in Albany California, bounded on the east by San Pablo Avenue, on the north by Buchanan Street, on the south by Harrison Street, and on the west by the Union Pacific Railroad tracks (Figure 1).

2.2 Project Background

The creek restoration project is part of a larger housing construction project. The project goal is to replace student housing that has surpassed its design lifetime, The project has been designed to provide treatment of stormwater runoff and to improve the habitat value and flood conveyance capacity of Codornices and Village Creeks.

Step 1 of the University Village student housing project was completed in 1999 included restoration of the section of Village Creek between Jackson Street and 6th Street to an open channel. At the downstream end of the restored channel, a box culvert was installed to provide conveyance for Village Creek, and access for emergency equipment.

The Step 2 University Village student housing project encompasses about 19 acres and includes demolition of old housing units, and construction of apartments, streets and parking areas. Step 2 of the project also includes daylighting, and restoring approximately 750 linear feet of Village Creek that used to run through a culvert. The creek was constructed by removing the concrete culvert, and excavating a new channel consisting of a stepped floodplain (i.e. low flow and high flow creek channels sized for a 100-year flood event). Several outfall structures including rock energy dissipater structures were constructed in the restored creek channel. The low and high flow creek channels were revegetated with riparian vegetation, and biodegradable erosion control matting was placed in the steep banks to prevent erosion while plants are establishing, The restored creek channel, when completely restored, will create approximately 0.52 acre of riparian habitat.

The project is subject to the following environmental permits and agreements:

- California Regional Water Quality Control Board, Water Quality Certification (File No. 2198.11);
- U.S. Army Corps of Engineers Section 404 Clean Water Act, Nationwide Permit 7 (File No. 29071S); and
- Department of Fish and Game, Lake and Streambed Alteration Agreement (Notification No. 1600-2004-0664-3).

These permits and agreements require UC Berkeley to conduct creek restoration activities, in conformance with Village Creek Planting Sheet L7.02, included in the construction design

drawings prepared by J.R. Roberts Corporation dated September 9, 2004 (J.R. Roberts Corporation, 2004) (Figure 2). Approved creek restoration activities included tree and shrub planting and hydroseeding of both the upper and lower creek banks. Plantings that were installed in the restored creek channel are presented in Table 1. The upper creek banks were required to be hydroseeded with 50 lbs per acre of an approved mixture of upland grasses and forbs, as shown in Table 1. The lower creek banks were to be hydroseeded with 49 lbs of a mixture of floodplain grass and forb species (Table 1). (J.R. Roberts Corporation. 2007).

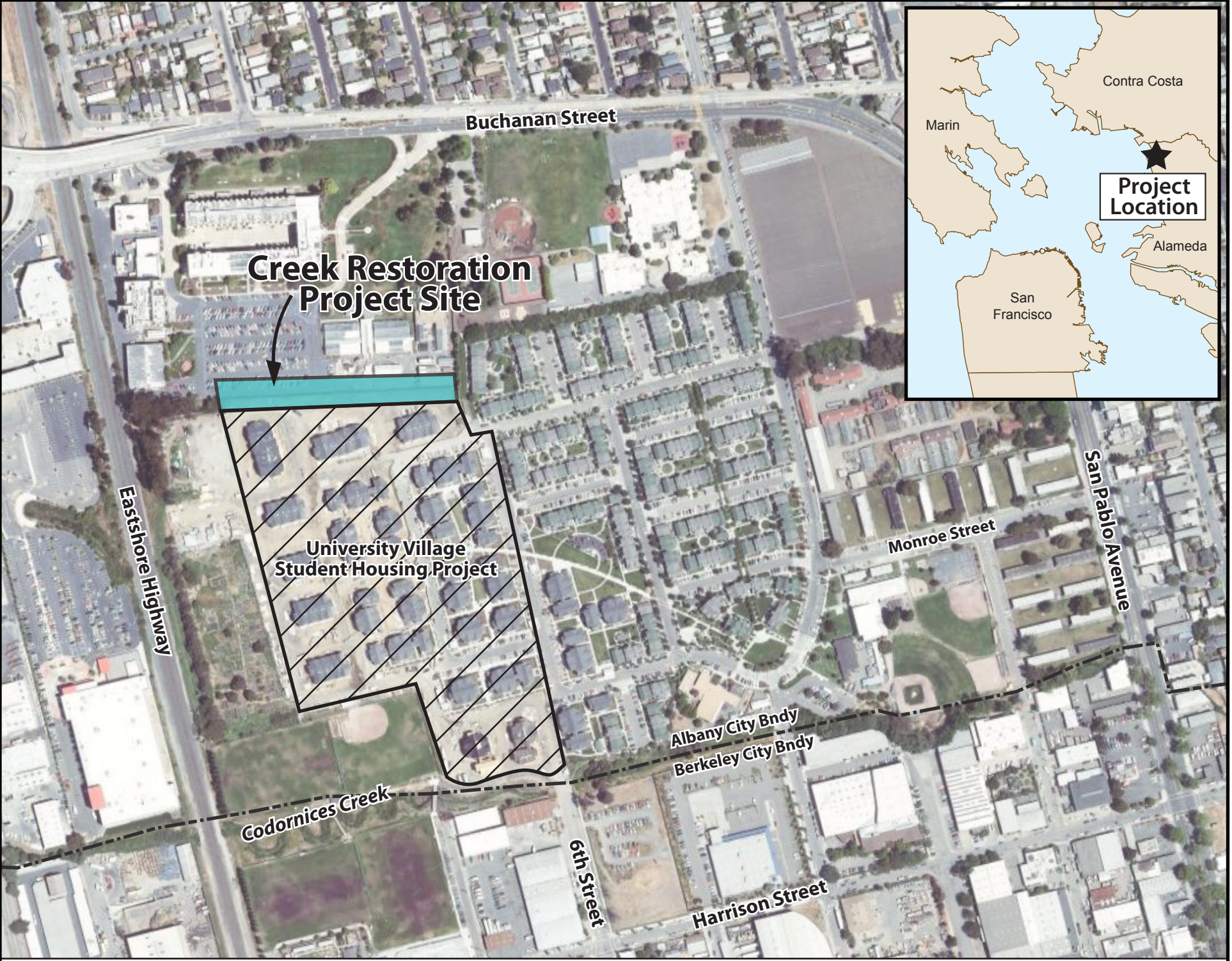
The creek restoration site was constructed in 2007 according to specifications (J.R. Roberts Corporation, 2004) (Figure 2). The site was prepared for planting in late September and early October 2007, and plant installation was completed by October 10, 2007 (T. Nowack, pers. comm.). The site was also hydroseeded in October 2007.

The University of California, Berkeley Capital Project has retained the service of May & Associates, Inc. to conduct the independent assessment of baseline site conditions and to perform 5 years of performance monitoring for the project. This report documents the results of the baseline (Year 1) performance monitoring that was conducted by May & Associates, Inc. in January 2008.

Table 1. Approved Site Planting List

Plant Species		Container Size	Quantity
Scientific Name	**Common Name**		
TREES			
Acer macrophyllum	Bigleaf maple	15 gal.	7
Aesculus californica	California buckeye	5 gal.	4
Populus fremontii	Fremont's cottonwood	5 gal.	9
Quercus agrifolia	Coast live oak	15 gal	12
Sambucus caerulea*	Blue elderberry	1 gal	59 (66)*
SHRUBS			
Baccharis douglasii	Marsh baccharis	1 gal	51
Baccharis pilularis	Coyote bush	1 gal	23
Baccharis pilularis ssp. pilularis (dwarf form)	Dwarf coyote bush	1 gal	26
Diplacus aurantiacus	Sticky monkey flower	1 gal	69
Mimulus gutattus	Monkey flower	1 gal	50
Perideridia kelloggii*	Kellogg's yampah	1 gal	46 (39)*
Rosa californica	California wild rose	1 gal	23
Total Shrub And Tree Plantings *Note- It appears 7 *Sambucus mexicana* were planted instead of 7 *Perideridea kelloggii*			**379**
UPPER CREEK BANK HYDROSEED MIXTURE (50 LBS/ACRE)			
Bromus carinatus	California brome grass	n/a	8
Elymus glaucus	Blue wildrye	n/a	8
Hordeum brachyantherum ssp. californicum	California barley	n/a	8
Fesctuca idahoensis	Idaho fescue	n/a	4
Nasella pulchra	Purple needlegrass	n/a	4
Poa secunda	Sandberg bluegrass	n/a	3
Eschscholtzia californica	California poppy	n/a	2
Baccharis pilularis ssp. pilularis (dwarf form)	Dwarf coyote bush	n/a	3
Lasthenia glabrata	Goldfields	n/a	1
Lupinus nanus	Sky lupine	n/a	3
Clarkia purpurea	Clarkia	n/a	2
Trifolium wildenovii	Tomcat clover	n/a	4
Total lbs/acre Upper Creek Bank			**50**
LOWER CREEK BANK HYDROSEED MIXTURE (49 LBS/ACRE)			
Agrostis pallens	Seashore bentgrass	n/a	6
Elymus glaucus	Blue wildrye	n/a	8
Hordeum brachyantherum	Meadow barley	n/a	8
Festuca rubra	Red fescue	n/a	6
Deschampsia caespitosa	Tufted hairgrass	n/a	5
Aster chilensis	California aster	n/a	2
Baccharis douglasii	Marsh baccharis	n/a	2
Epilobium cililatum	Fringed willowherb	n/a	4
Cyperus eragrostis	Umbrella sedge	n/a	3
Juncus effusus	Common rush	n/a	1.5
Scirpus maritimus	Alkali bulrush	n/a	3.5
Total lbs/acre Lower Creek Bank			**49**

Figure 1. Project Location



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January 2008 ss_villcrk_fig01_01-08

0 250 500 ft
0 100 200 m

North

Figure 1. Project Site

Figure 2. Planting Plan and Permanent Photomonitoring Locations

Figure 2. Planting Plan & Photo Monitoring Locations

SHRUBS Number Scientific Name / *Common Name*

- B DOU 51 (Baccharis douglasii / *Marsh Bacc.)*
- B PIL 23 (Baccharis pilularis / *Coyote Bush)*
- B PIL PIL 26 (Baccharis pilularis ssp. pilularis / *Dwarf Coyote Bush)*
- D AUR 69 (DiplacusI aurantiacus / *Sticky Monkey Flower)*
- M GUT 50 (Mimulus guttatus / *Monkey Flower*)
- P KEL 46 (Perideridea kelloggii / *Keollogg's yampah*)
- R CAL 23 (Rosa californica / *California Wild Rose*)
- S COE 59 (Sambucus caerulea / *Elderberry*)

TREES Number Scientific Name / *Common Name*

- AM 7 (Acer Macrophyllum / *Big Leaf Maple)*
- AC 4 (Aesculus Californica / *California Buckeye*)
- PF 9 (Populus Fremontii / *Fremont's Cottonwood*)
- QA 12 (Quercus Agrifolia / *Coast Live Oak)*

STUDY AREA BOUNDARY

CREEK

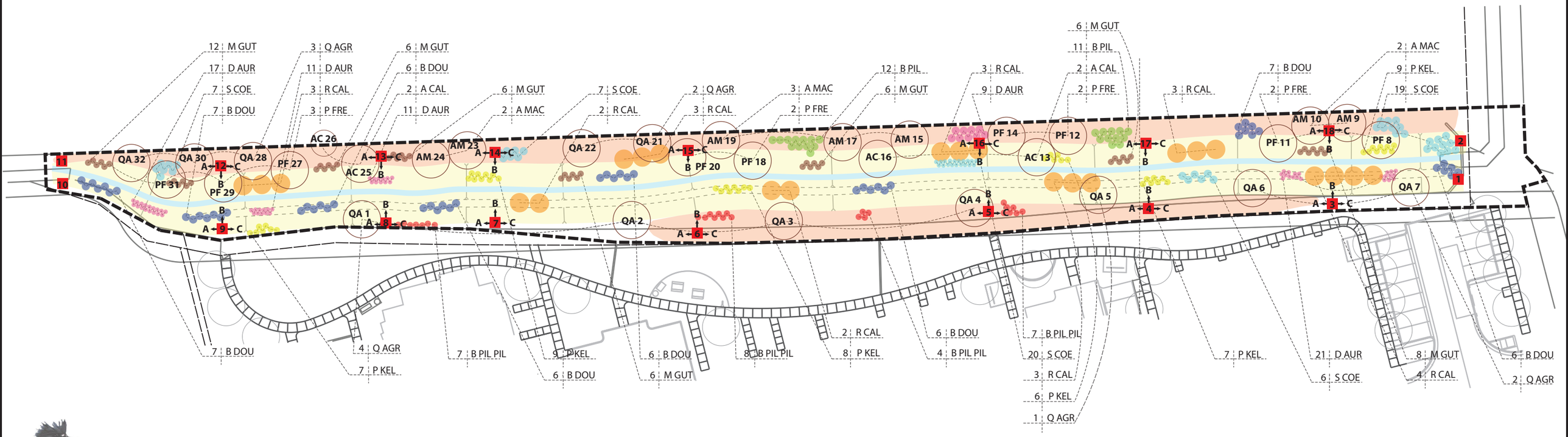
LOW CREEK CHANNEL

HIGH CREEK CHANNEL

(Point Number) A←13→C

(Direction of Shot) B

PHOTO POINT



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0 50 100 ft
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North

3.0 MONITORING METHODS

Vegetation monitoring requirements are stated in the following project permits:

- California Regional Water Quality Control Board, Water Quality Certification (File No. 2198.11);
- U.S. Army Corps of Engineers Section 404 Clean Water Act, Nationwide Permit 7 (File No. 29071S); and
- Department of Fish and Game, Lake and Streambed Alteration Agreement (Notification No. 1600-2004-0664-3).

Specifically, vegetation monitoring includes plant survivorship, vegetative cover, and plant height as three measures of success.

Monitoring was performed by Loran May, President and Senior Botanist with May & Associates on January 3, with a follow-up on January 7, 2008. The entire site was investigated on foot, and a plant count of the entire planting area was conducted. Each plant that was installed in October 2007 was assessed for health and vigor, height, and its species recorded for use in assessing progress towards performance criteria (described below).

3.1. Plant Survival

The permit performance criteria for plant survival is as follows: **80% survival of all plantings at the end of five years.** Plant survival counts entail conducting a complete inventory of all plantings at the site. Each tree and shrub planting was identified by species, recorded as alive or dead. Survival and mortality of hydroseeded areas was visually estimated as a percentage of overall vegetative cover.

3.2 Vegetative Cover

Project permits include performance criteria for vegetative cover as follows: **70% cover at Year 3, and 75% at the end of 5 years**. Vegetative cover was visually estimated for the upper and lower creek bank areas, and then averaged for the entire site.

3.3 Plant Height

The U.S. Army Corps of Engineers Nationwide Permit 7 and the California Department of Fish and Game Streambed Alteration Agreement also include a requirement to monitor plant height for trees and shrubs. No parameters were given for standards of performance; however, an increase in height in line with other planting sites in the region is the anticipated outcome of the project. Average height of living trees and shrubs were recorded to the nearest half of a foot using visual estimates and recorded on field data sheets.

3.4 General Site Observations

Prior to conducting plant survival counts, the site was thoroughly investigated on foot to record possible maintenance problems, trespass issues, weed problems, irrigation issues, or other factors that may have bearing on the site's overall habitat function or value.

4.0 MONITORING RESULTS

4.1 Plant Survival

Refer to Table 2 below for an overview of Baseline (Year 1) survivorship monitoring results presented by species. Baseline Year 1 plant survival was estimated at 82%, and therefore met the overall Year 5 80% survivorship performance standards for the project. However, remedial plantings are recommended to help ensure the project stays on track for the next four years to meet year 5 standards for this monitoring parameter. Refer to Section 5.0 Conclusions and Discussion below for more information about proposed remedial actions.

Notes on species composition in the hydroseeded will be collected in subsequent years, as well as information on any invasive plant species (if any) detected at the sites. It was not possible to determine species present in hydroseeded areas in January 2008 because most plants present were new seedlings without identifying characteristics.

Table 2. Results of Baseline Year 1 Plant Survivorship Monitoring (January 2007)

Plant Species		Original Plantings (Oct 2007)	Baseline (January 2008) Monitoring Results
Scientific Name	**Common Name**		
TREES			
Acer macrophyllum	Bigleaf maple	7	7
Aesculus californica	California buckeye	4	4
Populus fremontii	Fremont's cottonwood	9	9
Quercus agrifolia	Coast live oak	12	12
Sambucus caerulea/ Sambucus mexicana	Blue elderberry/ Mexican elderberry	59 (66)*	58
SHRUBS			
Baccharis douglasii	Marsh baccharis	51	42
Baccharis pilularis	Coyote bush	23	23
Baccharis pilularis ssp. pilularis (dwarf form)	Dwarf coyote bush	26	24
Diplacus aurantiacus	Sticky monkey flower	69	64
Mimulus gutattus	Monkey flower	50	30
Perideridia kelloggii	Kellogg's yampah	46 (39)*	29
Rosa californica	California wild rose	23	20
Total Shrub And Tree Plantings		**379**	**322**
*Note- It appears 7 *Sambucus mexicana* were planted instead of 7 *Perideridea kelloggii*			

4.2 Vegetation Cover

Baseline vegetation cover was visually estimated for upper creek banks and for lower creek banks that were hydroseeded in October 2007. By January 2008, both upper and lower creek bank areas were establishing well, with observed vegetation cover at 85% for Upper Creek banks, and 90% for lower creek banks (Photo 1). The baseline Year 1 observed vegetation cover exceeds Year 3 and 5 performance standards for the project. No remedial actions are necessary at this time for this monitoring parameter.

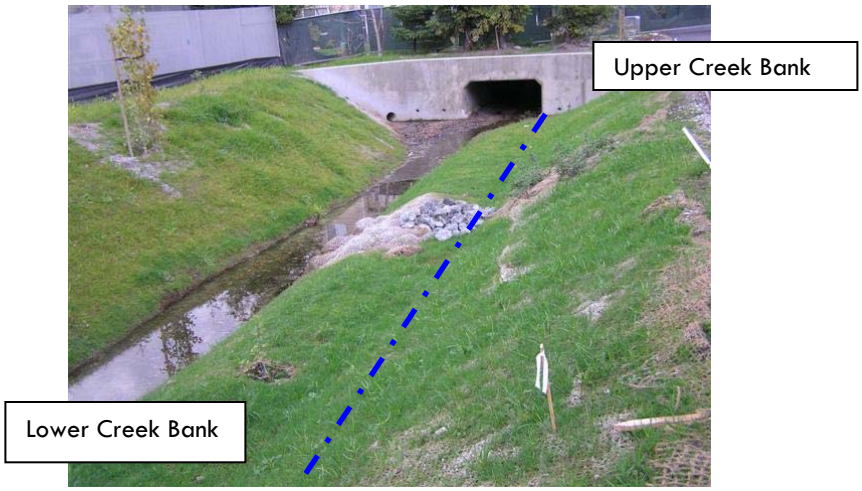


Photo 1. Typical vegetation cover, upper and lower creek banks

4.3 Plant Height

Plant height for the newly installed shrubs averaged 8 inches. Plant height for the trees varied from 4 to 5.5 feet for smaller trees such as bigleaf maple and California buckeye, to from 7 to 9.5 feet for larger trees such as coast live oak (Photo 2) and Fremont's cottonwood. Baseline Year 1 results will be visually compared against each year's result to determine if there is an overall increase in plant height over time.

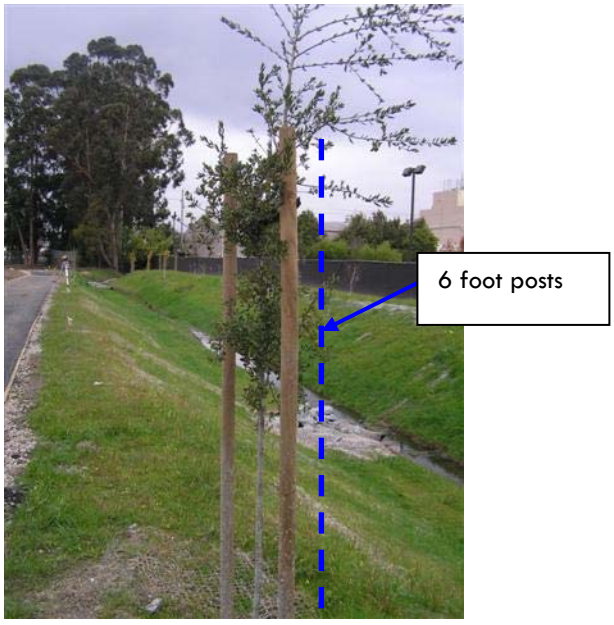


Photo 2. Typical coast live oak planting showing baseline for average tree height (est. at 7 to 9.5 feet).

Photo 3. Typical Sticky monkey shrubs showing baseline for average shrub height (est. at 8 inches)

The baseline Year 1 observed plant height is within the acceptable range at this time for the project. No remedial actions are necessary at this time for this monitoring parameter.

4.4 General Site Observations

In general, the site is establishing well, and is anticipated to conform to the approved planting plan and permit specifications. In January 2008, there was no evidence of unusual erosion, trespass, litter, or other site problems or issues that would require attention.

Overall, the hydroseed mixtures used in the upper and lower creek bank areas appears to conform to the approved planting plan prepared by J.R. Roberts Corporation. Hydroseeded areas of both the upper and lower creek bank areas have an acceptable vegetative cover of grasses and forbs, however there are some small patchy areas where establishment was less than the overall site average. These small bare patches that will be monitored closely during Year 2. The composition of the hydroseeded vegetation present cannot be determined at this time because seedlings are too small to have developed identifying characteristics. The hydroseeded areas will be checked as part of the Year 2 Monitoring (currently scheduled for November 2008) to confirm that expected species are present in hydroseeded areas, to double-check small patchy areas where seedlings are not establishing well, and also to detect any undesirable and/or invasive plant species that might be present.

Shrub and tree plantings in general appear to conform to the approved planting plan (Sheet L7.01, prepared by J.R. Roberts Corporation). Trees appear to be doing well, with most trees installed in October 2007 present and surviving by the January 2008 monitoring site visit. There was a greater-than-anticipated die off of some shrub species and of blue elderberry trees. There are several possible reasons for the lower than anticipated survivorship rate. One possibility is that the plants were diseased, root bound, or improperly installed. An example of this would be some of the observed California wild rose plants, which were spindly, and/or had chlorotic leaves at the time of the January survey (Photo 4). In general, California wild rose does not do well on newly-exposed creek banks, and replacement planting efforts may wish to substitute a different species such as marsh baccharis.

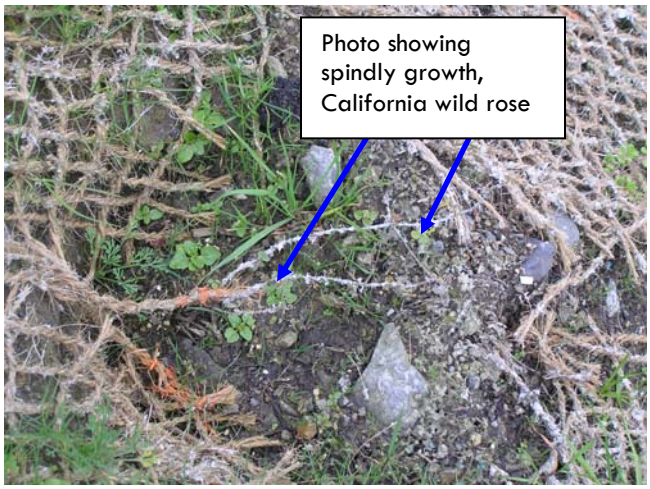


Photo 4. California wild rose showing spindly habitat and chlorotic leaves.

Another possibility is that the higher-than-anticipated rainfall rates of January 2008 resulted in unusual flow patterns in the newly created channel that may have in turn resulted in inundation for long periods of time, (and the related mortality of some of the newly installed plants - especially along the lowest flow area). Replacement plantings should be moved up from the low flow channel a few feet to help prevent newly installed plants from washing away of drowning in future storm events.

A final possibility is that plant species were installed in areas where the individual species are not thriving due to microclimatic conditions. An example if this is the observed mortality of an entire cluster of sticky monkey flower that was installed immediately adjacent to flowing water of the constructed channel. This species tends to favor drier conditions, and would be more likely to persist if placed higher on the creek bank in the future.

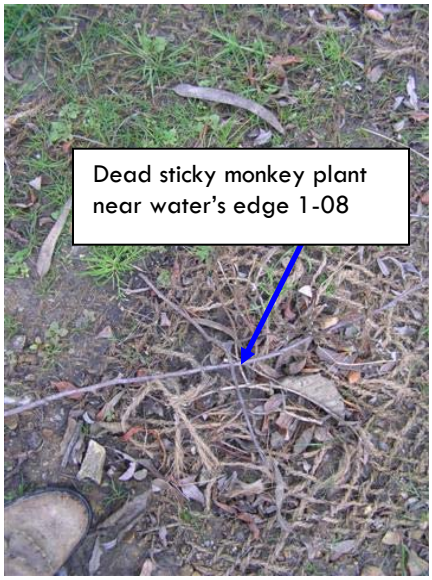


Photo 5. Close-up of dead sticky monkey flower plant adjacent to water in creek.

Regardless of the reason for plant mortality, some remedial plantings are recommended to make sure the project stays on track to meet year 5 performance criteria, as described below in Section 5.0. Refer to Figure 3 for recommended planting locations.

5.0 CONCLUSIONS AND RECOMMENDATIONS

In conclusion, the Village Creek site was planted in accordance with approved design drawings and specifications. Refer to Table 3 for a summary of Year 1 performance as compared to overall project performance standards.

Table 3. Summary of Year 1 Performance (1-2008)

Monitoring Parameter	Project Performance Standard	Observed Year 1 Site Conditions	Performance Standard Met? Y/N
Plant Survivorship	80% survival of all plantings by Year 5	85% Survivorship	Y
Vegetative Cover	70% vegetative cover by Year 3 75% vegetative cover by Year 5	85% Upper Creek Bank, 90% lower creek bank	Y
Plant Height	Overall Increase by Year 5	Trees, 7-9.5 feet, Shrubs 8 inches	Y

The site was hydroseeded with a seed mixture that was approved by the University of California, Berkeley. Overall, hydroseeded areas had good grass and forb establishment, estimated at 85-90% vegetative cover at the time of the January 2008 site survey. The baseline Year 1 observed vegetation cover exceeds Year 3 and 5 performance standards for the project. There were small patchy areas within the hydroseeded areas with low seedling establishment, and these patches will be closely monitored during year 2 (November 2008).

The baseline Year 1 observed plant height is within the acceptable range at this time for the project.

Baseline Year 1 plant survivorship standards were met, however, remedial plantings are still recommended to help ensure the project stays on track over the next 4 years to meet Year 5 performance standards for this monitoring parameter. The following remedial replacement plantings are recommended for shrubs species to help ensure the project will meet its performance standards for plant survivorship by Year 5 of the project (Table 4). Refer to Figure 3 for recommended plant replacement locations.

Table 4. Recommended Replacement Plantings, Year 1 (1-2008)

Plant Species		Original Plantings (Oct 2007)	Recommended Remedial Plantings
Scientific Name	**Common Name**		
TREES			
Sambucus caerulea	Blue elderberry	59 (66)*	1
SHRUBS			
Baccharis douglasii	Marsh baccharis	51	3
Baccharis pilularis ssp. pilularis	Dwarf coyote bush	26	2
Diplacus aurantiacus	Sticky monkey flower	69	5
Mimulus gutattus	Monkey flower	50	20
Perideridia kelloggii	Kellogg's yampah	46 (39)*	17
Rosa californica	California wild rose	23	**Recommend Substituting 3 Marsh baccharis
Total Shrub And Tree Plantings *Note- It appears 7 *Sambucus mexicana* were planted instead of 7 *Perideridea kelloggii* ***Note: wild rose are not doing well at the site- recommend substitute planting for this species.*		**379**	**51**

Figure 3. Recommended Remedial Planting Locations (Year 1)

Figure 3. Recommended Remedial Planting Locations (Year 1)

Recommended Plantings (51 Total)

Shrubs Number Scientific Name / *Common Name*

- B DOU 6 (Baccharis douglasii / *Marsh Bacc.)*
- D AUR 5 (Diplacusl aurantiacus / *Sticky Monkey Flower)*
- M GUT 20 (Mimulus guttatus / *Monkey Flower*)
- P KEL 17 (Perideridea kelloggii / *Keollogg's yampah*)
- S COE 1 (Sambucus caerulea / *Elderberry*)
- B PIL PIL 2 (Baccharis pilularis ssp. pilularis / *Dwarf Coyote Bush*)

Existing Trees Number Scientific Name / *Common Name*

- AM 7 (Acer macrophyllum / *Big Leaf Maple)*
- AC 4 (Aesculus californica / *California Buckeye*)
- PF 9 (Populus fremontii / *Fremont's Cottonwood*)
- QA 12 (Quercus agrifolia / *Coast Live Oak)*

Existing Shrubs Number Scientific Name / *Common Name*

- B DOU 51 (Baccharis douglasii / *Marsh Bacc.)*
- B PIL 23 (Baccharis pilularis / *Coyote Bush)*
- B PIL PIL 26 (Baccharis pilularis ssp. pilularis / *Dwarf Coyote Bush)*
- D AUR 69 (Diplacusl aurantiacus / *Sticky Monkey Flower)*
- M GUT 50 (Mimulus guttatus / *Monkey Flower*)
- P KEL 46 (Perideridea kelloggii / *Keollogg's yampah*)
- R CAL 23 (Rosa californica / *California Wild Rose*)
- S COE 59 (Sambucus caerulea / *Elderberry*)

STUDY AREA BOUNDARY

CREEK

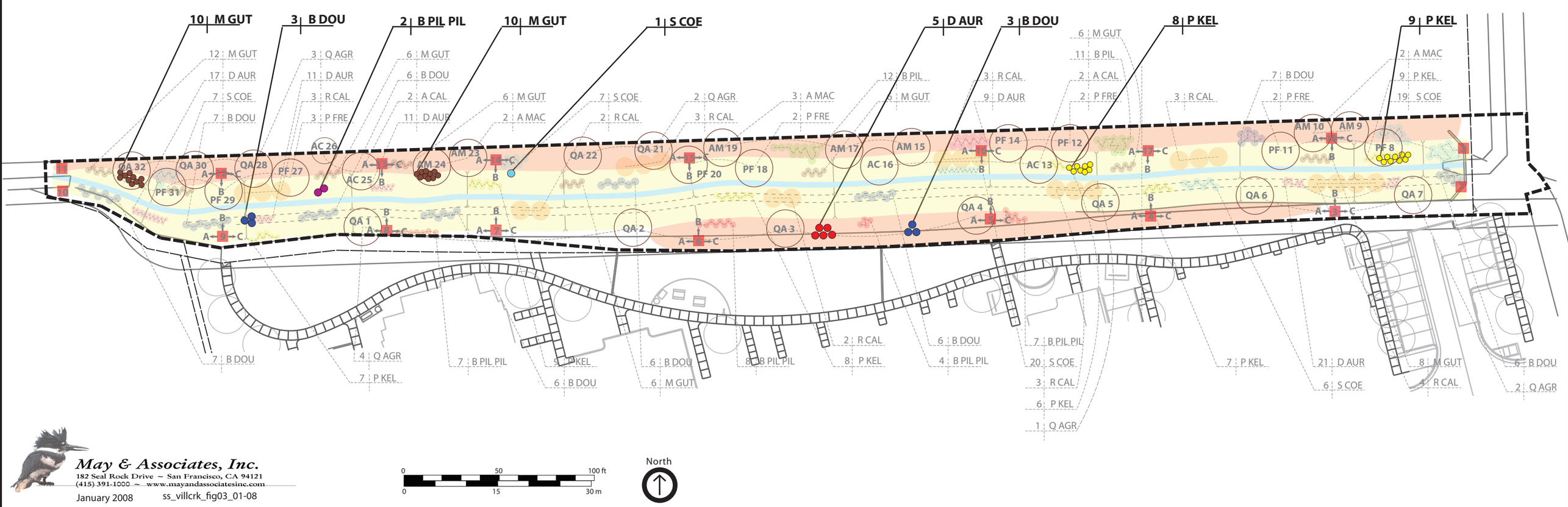
LOW CREEK CHANNEL

HIGH CREEK CHANNEL

(Point Number) A←13→C

(Direction of Shot) B

PHOTO POINT



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January 2008 ss_villcrk_fig03_01-08

0 50 100 ft
0 15 30 m

North

6.0 REFERENCES

6.1 Printed References

J.R. Roberts Corporation. 2004. Village Creek Planting Sheet L7.02 dated September 9, 2004.

J.R. Roberts Corporation. 2007. Village Creek Seed Mix for Village Creek (Submittal Package No 122-02920-01-006).

California Department of Fish and Game Streambed Alteration Agreement, Notification No. 1600-2004-0664-3 dated December 13, 2004.

California Regional Water Quality Control Board, Water Quality Certification No. 2198.11, Site No 02-01-C0829 Dated December 14, 2004.

U.S. Army Corps of Engineers, Section 404.Natonwide Permit No. 7 File # 29071S Dated December 11, 2004.

6.2 Personal Communications

Nowak, Tom. Project Coordinator, University Village, Albany, Step 2. Personal communication via email on 1-07-2008. tnowak@cp.berkeley.edu (510) 643-3303.

APPENDIX A. SITE PHOTOGRAPHS

Photo Point 1 BASELINE (Jan 2008)

Photo Point 2 BASELINE (Jan 2008)

Photo Point 3A BASELINE (Jan 2008)

Photo Point 3B BASELINE (Jan 2008)

Photo Point 3C BASELINE (Jan 2008)

Photo Point 4A BASELINE (Jan 2008)

Photo Point 4B BASELINE (Jan 2008)

Photo Point 4C BASELINE (Jan 2008)

Photo Point 5A BASELINE (Jan 2008)

Photo Point 5B BASELINE (Jan 2008)

Photo Point 5C BASELINE (Jan 2008)

Photo Point 6A BASELINE (Jan 2008)

Photo Point 6B BASELINE (Jan 2008)

Photo Point 6C BASELINE (Jan 2008)

Photo Point 7A BASELINE (Jan 2008)

Photo Point 7B BASELINE (Jan 2008)

Photo Point 7C BASELINE (Jan 2008)

Photo Point 8A BASELINE (Jan 2008)

Photo Point 8B BASELINE (Jan 2008)

Photo Point 8C BASELINE (Jan 2008)

Photo Point 9A BASELINE (Jan 2008)

Photo Point 9B BASELINE (Jan 2008)

Photo Point 9C BASELINE (Jan 2008)

Photo Point 10 BASELINE (Jan 2008)

Photo Point 11 BASELINE (Jan 2008)

Photo Point 12A BASELINE (Jan 2008)

Photo Point 12B BASELINE (Jan 2008)

Photo Point 12C BASELINE (Jan 2008)

Photo Point 13A BASELINE (Jan 2008)

Photo Point 13B BASELINE (Jan 2008)

Photo Point 13C BASELINE (Jan 2008)

Photo Point 14A BASELINE (Jan 2008)

Photo Point 14B BASELINE (Jan 2008)

Photo Point 14C BASELINE (Jan 2008)

Photo Point 15A BASELINE (Jan 2008)

Photo Point 15B BASELINE (Jan 2008)

Photo Point 15C BASELINE (Jan 2008)

Photo Point 16A BASELINE (Jan 2008)

Photo Point 16B BASELINE (Jan 2008)

Photo Point 16C BASELINE (Jan 2008)

Photo Point 17A BASELINE (Jan 2008)

Photo Point 17B BASELINE (Jan 2008)

Photo Point 17C BASELINE (Jan 2008)

Photo Point 18A BASELINE (Jan 2008)

Photo Point 18B BASELINE (Jan 2008)

Photo Point 18C BASELINE (Jan 2008)