



Technical Memorandum

Date: November 24, 2006

To: Stormwater Quality Standards Task Force

From: CDM

Subject: Recreational Use Survey Data Report – Cucamonga Creek

Introduction

To support Santa Ana River Basin Plan triennial review efforts, an evaluation of the appropriateness of REC-1 beneficial use designations and associated bacteria water quality objectives in the Santa Ana River Watershed is being performed by the Santa Ana Stormwater Quality Standards Task Force. The Task Force consists of representatives from a variety of stakeholder interests, including the Santa Ana Watershed Project Authority; the counties of Orange, Riverside, and San Bernardino; special districts; the Santa Ana Regional Water Quality Control Board; EPA Region 9; and local environmental groups, with assistance from CDM and Risk Sciences, Inc. As part of study efforts, recreational use surveys were performed upon select waterbodies to obtain information regarding current levels of recreational use. This report summarizes results from use surveys conducted at two locations on Cucamonga Creek.

Study Location

Cucamonga Creek at Hellman Avenue was selected as the survey location. Two cameras were installed at this bridge crossing, one facing upstream at a concrete lined section of the channel, and one facing downstream, where the channel transitions into a more natural condition prior to entering the Prado Basin.

Figure 1 illustrates the survey location and depicts the physical characteristics of Cucamonga Creek upstream and downstream of Hellman Avenue. Photos show the general conditions of Cucamonga Creek in the vicinity of the location (Figure 2).

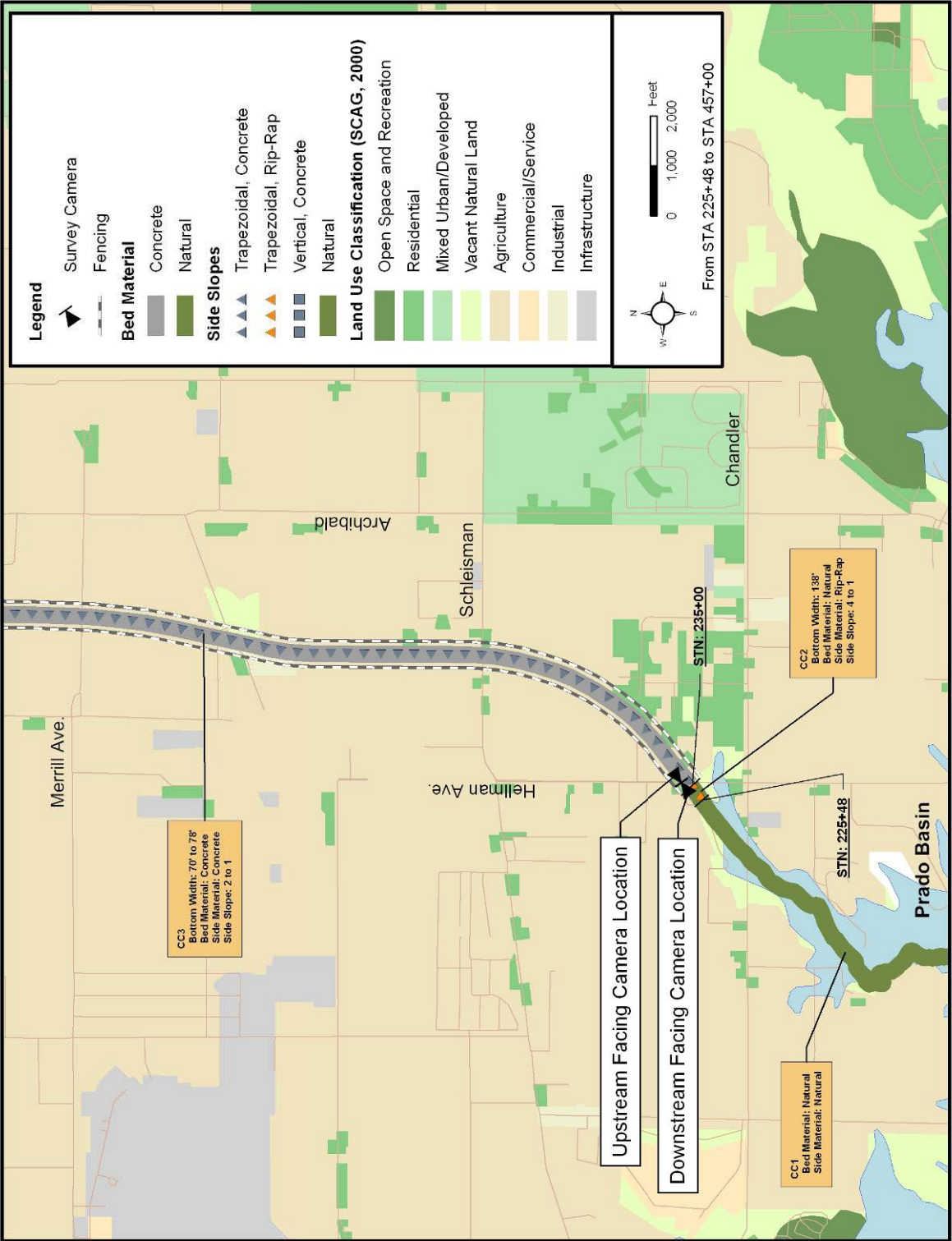


Figure 1
 Location of Recreational Use Surveys and Physical Characteristics for Cucamonga Creek



Figure 2a
Photo of Cucamonga Creek, Looking Upstream from Hellman Avenue



Figure 2b
Photo of Cucamonga Creek, Looking Downstream from Hellman Avenue

Survey Design

Advanced digital cameras and data transfer technology, coupled with weekly on-location physical surveys were used to collect recreational use data at each location. Observer IV™ cameras were equipped with cellular data transmission equipment to collect an image at each location every fifteen minutes, and transfer the image to a secure data storage server via a file transfer protocol (FTP) site. Weekly site visits were conducted to log recreational use observations, and monitor and maintain the image collection equipment. This survey design was selected to provide unprecedented levels of data to characterize recreational use. Figure 3 shows the final camera installation at the recreational use survey location.

The duration of survey and number of images collected on Cucamonga Creek is shown in Table 1. An image was collected every fifteen minutes throughout the study duration unless signal strength fluctuations or equipment failures precluded collection and transmission. Images were not collected at night due to darkness.

The image collection equipment and technology worked adequately throughout the survey period at both survey locations on Cucamonga Creek, but due to signal strength fluctuation issues and other equipment functionality issues, periodic, short term gaps in image collection occurred. These gaps ranged from relatively minor single, fifteen-minute interval image gaps, which occurred on numerous days, to gaps in image collection spanning several days. Due to poor cellular signal at the upstream facing location the camera operation required a greater power demand and would function adequately for the first few days after weekly maintenance (battery change). Table 2 summarizes the data gaps of one week or longer.



Figure 3a
Photo of the Recreational Use Survey Camera Installation Looking
Upstream at Hellman Avenue



Figure 3b
Photo of the Recreational Use Survey Camera Installation Looking
Downstream at Hellman Avenue

Table 1 Recreational Use Survey Duration			
Survey Location	Start Date	End Date	Number of Images
Cucamonga US	11/1/05	11/1/06	2,546
Cucamonga DS	11/1/05	11/1/06	17,678

Table 2 Recreational Use Survey Data Gaps		
Location	Data Gap Period	Cause
Cucamonga US	December 1 – 8, 2005	Battery Failure
	December 16 – 22, 2005	Battery Failure
	January 13 – 19, 2006	FTP server down
	January 27 – February 3, 2006	Battery Failure
	February 12 – 17, 2006	Battery Failure
	February 27 – March 5, 2006	Battery Failure
	April 9 – 18, 2006	Battery Failure
	April 29 – May 5, 2006	Battery Failure
	July 15 – 24, 2006	Battery Failure
	August 28 – September 6, 2006	Battery Failure
Cucamonga DS	September 10 – 17, 2006	Battery Failure
	December 11 – 21, 2005	Battery Failure
	January 13 – 19, 2006	FTP server down
	February 6 – 16, 2006	Battery Failure
	July 12 – 24, 2006	Camera Failure

Images were stored and individually reviewed for activity. A use/activity categorization protocol was established for logging and categorizing observed activity from both image review and physical surveys. Within the protocol, information regarding water contact activity, including the type or magnitude of contact, and non-water contact activity, was collected and logged in the following categories:

- Date/Time
- Number of People
- Type of Contact
 - Incidental Contact

- Contact Below Ankle
 - Contact Between Ankle and Waist
 - Contact Between Waist and Neck
 - Contact Above Neck
 - Non-Recreation Contact
-
- Non-Contact Activity

Images containing a person or persons within channel fencing or boundaries (including on-site surveys where a person or persons were observed) were considered “events”.

An event could include one or more persons. For each event, each person’s activity (type), and its duration and magnitude were logged per the established protocol. If an activity was captured within one image, an activity duration was reported as <30 minutes. Likewise, if an activity was observed within two consecutive fifteen-minute interval images, the duration was reported as <45 minutes.

Appendix A of this report contains images of all events that were counted as contact recreational use, and representative pictures of non-contact recreational use events. Captured channel maintenance activities were observed in several images but not considered to be recreational use activity. These activities were observed at the upstream Cucamonga Creek location.

Survey Results

Table 3 summarizes all water contact recreational events (individuals) observed for each of the survey locations and provides the date, potential duration, and magnitude of contact. Table 4 summarizes non-water contact types of recreational use. The total number of individuals recreating, estimated duration of recreation, and seasonal patterns are included in the summary table. The commonly used seasonal periods in southern California NPDES stormwater permits were used to categorize the observations by season (April 1 to September 30 for Summer, October 1 to March 31 for Winter).

Table 3 Water Contact Recreation Events Recorded for Cucamonga Creek				
Location / Date	Time	Duration (min)	Magnitude of Contact	Image ID
<i>Cucamonga Creek Upstream from Hellman Avenue</i>				
No events were observed				
<i>Cucamonga Creek Downstream from Hellman Avenue</i>				
12/24/2005	9:30	< 30	Between Ankle and Waist	Cucamonga_DS-05-12-24-09-30
1/8/2006	15:00	< 30	Between Ankle and Waist	Cucamonga_DS-06-01-08-15-00
2/22/2006	11:45	< 30	Between Ankle and Waist	Cucamonga_DS-06-02-22-11-45
3/14/2006	17:00	< 30	Between Ankle and Waist	Cucamonga_DS-06-03-14-17-00
3/25/2006	9:50	< 60	Between Ankle and Waist	Cucamonga_DS-06-03-25-09-50 Cucamonga_DS-06-03-25-10-05 Cucamonga_DS-06-03-25-10-15
3/29/2006	18:00	< 30	Between Ankle and Waist	Cucamonga_DS-06-03-29-18-00
8/25/2006	10:30	< 30	Below Ankle	Cucamonga_DS-06-08-25-10-30
9/13/2006	12:35	< 30	Below Ankle	Cucamonga_DS-06-09-13-12-35

Table 4 Non-Water Contact Recreation Events Recorded for Cucamonga Creek					
Location	Number of Individuals			Duration (min)	Types of Activities
	Total	Summer	Winter		
Cucamonga Creek Upstream	1	1	0	30	Vehicle driving in water
Cucamonga Creek Downstream	27 19		8	810	Walking, horseback riding in water

Summary of Findings

Approximately 20,500 recreational and use data points were collected over a one year duration from Cucamonga Creek, upstream and downstream of Hellman Avenue. Survey results indicate a very low frequency of water contact recreational use both upstream and downstream of Hellman Avenue, regardless of season. Infrequent recreational use was observed only in Cucamonga Creek downstream of the Hellman Avenue crossing. Eight data points or images out of 17,932 collected at the downstream location indicated actual water contact. The duration was short, less than thirty minutes in seven out of eight events. The magnitude of contact was always below the waist, with no data points indicating full body contact or immersion.

Non-contact recreational activity, such as walking along the channel banks, was more frequent than contact activity, and results indicate an increase in the frequency of non-contact activity during the summer season for Cucamonga Creek downstream of Hellman Avenue.

Conversely, no observations indicated recreational use, water contact or non-water contact, in Cucamonga Creek upstream of the Hellman Avenue crossing. The difference in results shows that differences in channel characteristics between Cucamonga Creek upstream and downstream of the Hellman Avenue crossing may play a significant role in recreational use potential.

Appendix A
Select Photos from Cucamonga Creek Survey Locations

Cucamonga Creek at Hellman Avenue, Upstream



No Activitv: 1/4/2006 14:05



Non-Contact Recreation: 9/9/2006 17:00



Maintenance: 12/1/2005 14:15

Cucamonga Creek at Hellman Avenue, Downstream



No Activity: 12/07/2005 12:35



Contact Recreation: 12/24/2005 9:30



Contact Recreation: 1/8/2006 15:00



Contact Recreation: 2/22/2006 11:45



Contact Recreation: 3/14/2006 17:00



Contact Recreation: 3/25/2006 9:50



Contact Recreation: 3/25/2006 10:05



Contact Recreation: 3/25/2006 10:15



Contact Recreation: 3/29/2006 18:00



Non-Contact Recreation: 4/7/2006 14:15



Contact Recreation: 8/25/2006 10:30



Contact Recreation: 9/13/2006 12:35