Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Prepared by the Resource Conservation District of the Santa Monica Mountains
Kathleen Bullard, Executive Officer, and Sean Manion, Conservation Biologist

October 20, 1997

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Methodology

Sean Manion, Conservation Biologist, and Kathleen Bullard, Executive Officer, of the Resource Conservation District of the Santa Monica Mountains staff went on October 11 and 13, 1997 to the eleven sites in the Malibu Creek Watershed that are listed to be cleared of vegetation by the Los Angeles County Department of Public Works in preparation for possible heavy winter storms. Using the information provided by Public Works, we photographed the sites, estimated the percentage of canopy cover and the number of trees over 4" DBH (diameter at breast height), and any significant ecological features. We have assessed the potential of the habitat for varying species, and where possible, observed the substrate in each location. Our report is organized by the importance of the habitat and most deserving of special attention. Site numbers refer to the *Los Angeles County Department of Public Works Soft Bottom Channel Reaches Report* dated 9/16/97.

Watershed Overview

The eleven sites in this report are in the Malibu Creek Watershed, where since 1991 a Watershed Executive and Advisory Council has met to understand issues of water quality and is actively implementing solutions. These sites are in the upper watershed, and many were turned over to Los Angeles County Public Works maintenance as part of development projects and were approved for a 50-year design storm capacity. All of these sites in some way function as habitat, but vary in their functioning to a greater and lesser degree.

Total Suspended Solids are the highest pollutant in the Malibu Creek Watershed according to the Santa Monica Bay Restoration Plan. Erosion, while natural, becomes much greater under disturbed conditions. Natural erosion tends to occur in seasonal pulses generated by storms, and organisms have adapted to these dynamic, climate-induced conditions. When erosion becomes chronic and continual, it becomes a major stressor on the flora and fauna. For example, fine sediments can overlay gravels and sands needed for in-stream spawning habitat. Trees also reduce water temperatures due to the effects of shading. By removing the canopy, temperatures can increase, degrading habitat locally and downstream, especially for steelhead trout, now listed as endangered in this watershed. Willows and cattails also perform the function of improving water quality through the uptake of nutrients, another pollutant of special concern in this watershed. If mechanical (bulldozer) clearing is used, sites that were stabilized by vegetation, may become unstable, and fail. Where vegetation is providing bank stability we have noted this in the site assessment. For more information on this, please see *The Economy and Ecology of Streambank Trees* in Appendix C. While this was done on a reach of Topanga Creek in the Topanga Watershed, the results apply equally here.

Resource Conservation District of the Santa Monica Mountains
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Site # 31 Las Virgenes Creek: 475' upstream of Meadow Creek Lane to 222' upstream of Meadow Creek Lane.

This site is bounded by Lost Hills Road to the west, and to the east are the Lincoln Meadows Apartments. Agoura Road and Meadow Creek Lane cross Las Virgenes Creek to the north and south respectively. This site is upstream of the culvert going into the Meadow Creek Lane. Just downstream of the Lost Hills Road crossing, the creek follows the Las Virgenes Road, past Juan de Anza Park and then into Malibu Creek State Park. It is here that it joins with Malibu Creek, and eventually flows to Malibu Lagoon State Beach and Santa Monica Bay.

The site has a tree canopy of approximately 75% or greater and many willows are over 4" DBH or greater (approximately 200). This habitat is part of a critical wildlife corridor between the Simi Hills and the State Park system. The substrate of the creek is silts and fine clays forming a thick veneer over the original cobbles and gravels. When we observed the site on October 11, we observed numerous lizards (sideblotched, alligator and western fence) as well as mourning doves, and red-tail hawk. A thorough biological assessment through three seasons was performed in part, for fulfillment of California Department of Fish and Game Streambed Alteration Permit requirements. The site is best described as Southern Willow Scrub (Long 1995). The site has been utilized by two sensitive species, the white-tailed kite and yellow warblers. Mammals using this site include ground squirrel, Audubon's cottontail, raccoon, skunk, and mule deer. Tree frogs were observed at the Meadow Creek Street undercrossing. Please see Appendix A for the complete biological assessment report by biologist Michael C. Long which covers both the Las Virgenes Creek streambank restoration site and the area proposed for channel clearing.

Las Virgenes Creek approximately 500' upstream of this location is presently undergoing a channel widening, slope stabilization, and revegetation. The project is funded primarily under Los Angeles County 1992 Prop A funds, an EPA Clean Water Act 319 grant from the Los Angeles Regional Water Quality Control Board, and the City of Calabasas. The streambank restoration is designed to correct a thirty foot embankment with a 1:1 slope and the constriction upstream that is the source of the erosion. In the process of stabilizing the slope, the carrying capacity of the channel will be increased upstream of the proposed channel clearing by the Los Angeles County Department of Public Works.

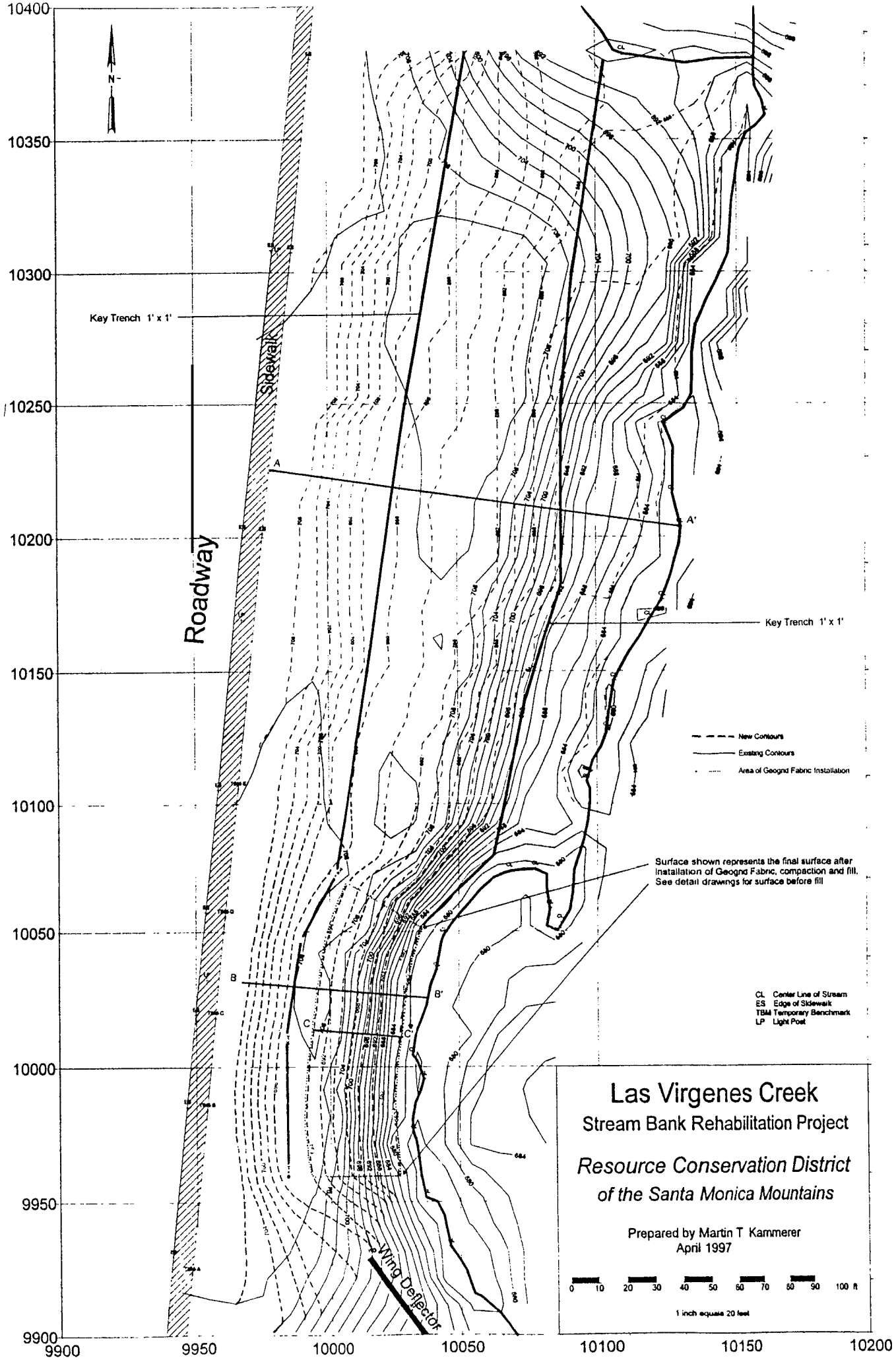
In preparation for this project, an *Hydraulic Impact Report* models the water flow using the Army Corps of Engineer's HEC-RAS analysis before and after the streambank restoration. A shortened version of this report is in Appendix B. For the complete report, and/or a copy of *the Geologic and Geotechnical Engineering Investigation*, please call the Resource Conservation District of the Santa Monica Mountains office at (310) 455-1030 and request copies.

The streambank restoration project will use geotextile fabric placed into the slope to prevent lateral movement and the soil compacted. Erosion blankets to be installed on the slope were

chosen based on their tensile strength. A native seed mix will be placed under the erosion blankets, and an irrigation system will be installed and maintained by the Calabasas Landscape District. Plants collected previously from the site will be planted as well as others from a local native plant nursery. For a more complete description of the project please see the *Project Manual for the Las Virgenes Creek Streambank Restoration,* also available at the RCD office.

Recommendations

Because the stream's carrying capacity will be increased upstream of the proposed site for clearing, we recommend that site #31 referenced above be removed from the list of creek stretches proposed for clearing and be allowed to remain in its current condition. If the hydrology indicates that thinning is still deemed necessary to increase channel capacity, then this should consist of selective vegetation removal by hand with the roots allowed to remain for slope stability.


N
Key Trench 1' x 1'
Sidewalk
Roadway
A
A'
Key Trench 1' x 1'
B
B'
C
C'
Wing Deflector
New Contours
Existing Contours
Area of Geogrid Fabric Installation
Surface shown represents the final surface after installation of Geogrid Fabric, compaction and fill. See detail drawings for surface before fill
CL Center Line of Stream
ES Edge of Sidewalk
TBM Temporary Benchmark
LP Light Post
Las Virgenes Creek
Stream Bank Rehabilitation Project
Resource Conservation District
of the Santa Monica Mountains
Prepared by Martin T Kammerer
April 1997
0 10 20 30 40 50 60 70 80 90 100 ft
1 inch equals 20 feet
10400
10350
10300
10250
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10000
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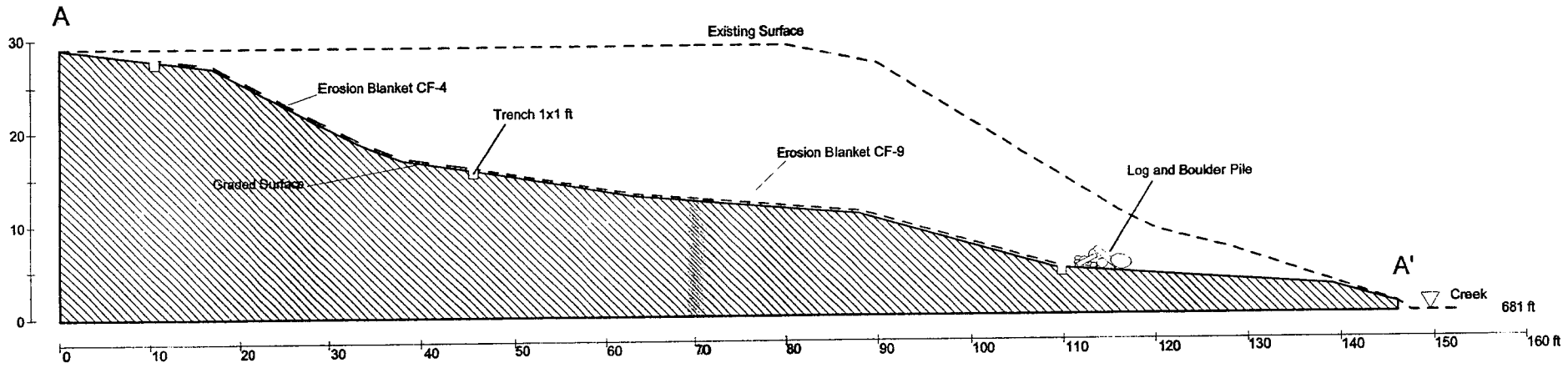
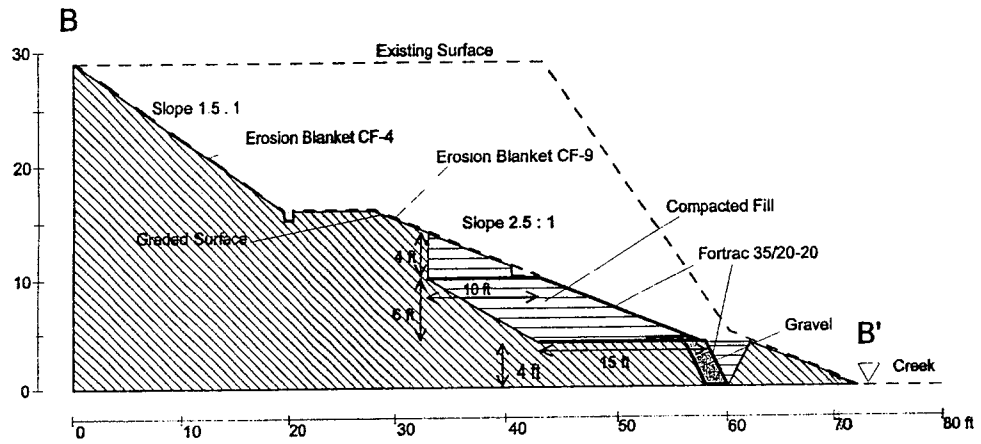




Las Virgenes Creek

Stream Bank Rehabilitation Project

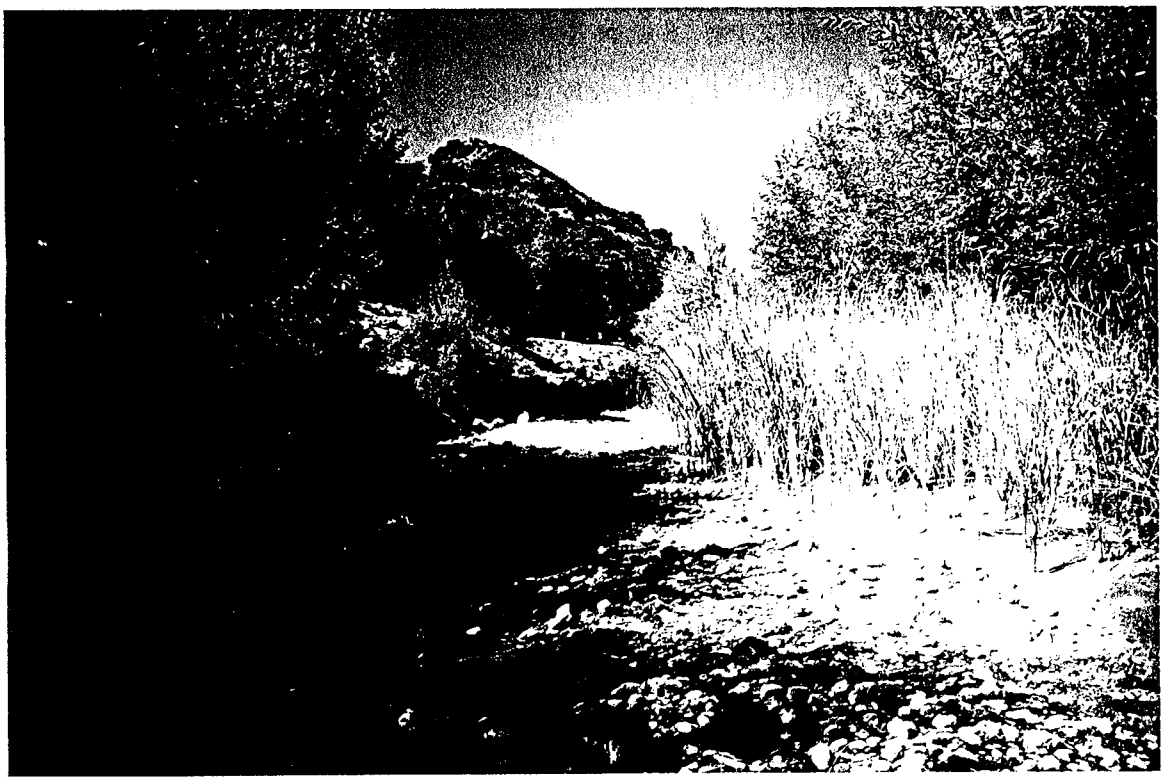
Resource Conservation District of the Santa Monica Mountains

Prepared by Martin T. Kammerer
June 1997

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

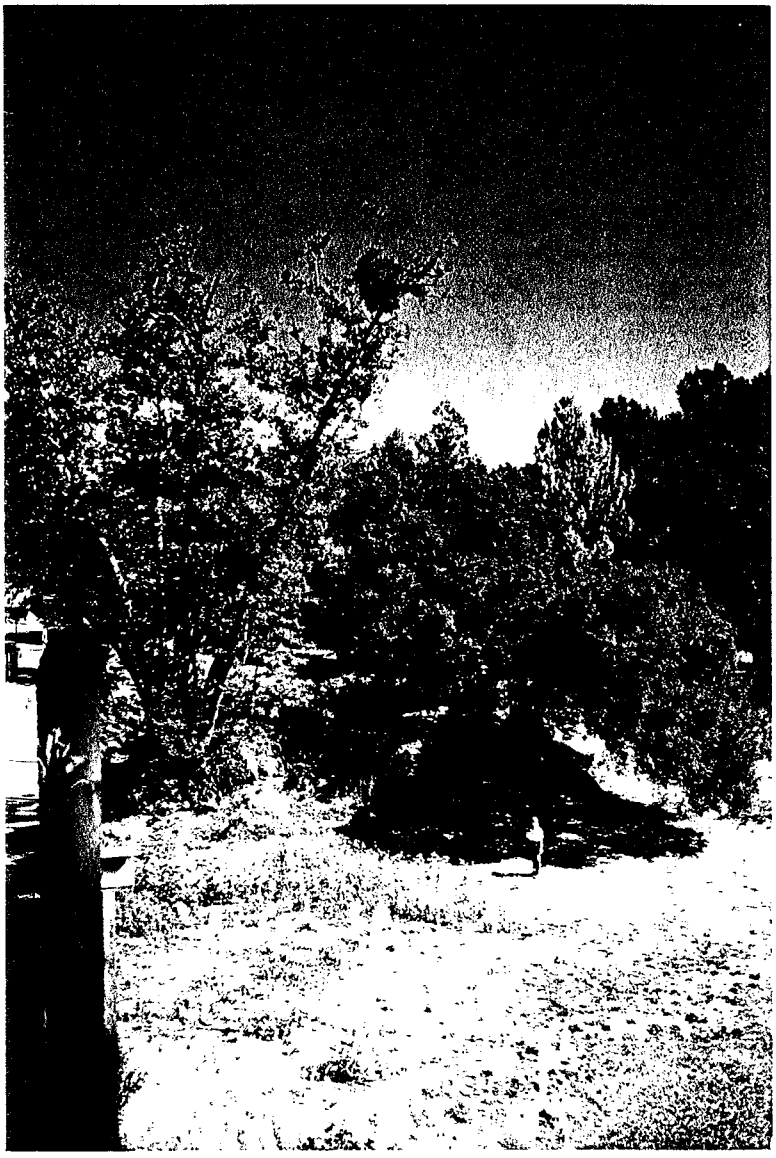
Site #28 Triunfo Creek: 384' upstream of Mullholland Highway to the downstream edge of Mullholland Highway.

This particular reach is adjacent to Peter Strauss Ranch, a National Park Service Site. The creek bottom, although dry, consisted of medium to large cobbles and two pools of standing water that were observed being utilized by ducks and a great blue heron. The pools may serve as southwestern pond turtle habitat and for tree frogs. In the main channel small willows and cattails were growing. On the western bank we observed larger willows and significant understory habitat, and near the Mulholland overcrossing several significant sycamores are providing bank protection. Many mourning doves were observed at the site and just upstream of the sycamore, an owl roost site was noted due to the numerous pellets. One of the sycamores just on the downstream side of Mullholland has exposed roots. A large California live oak was observed downstream of Mulholland. Tree canopy was estimated at 10-15% with approximately 50 willows at 4" DBH or greater.



Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site #28 Triunfo Creek: 384' upstream of Mullholland Highway to the downstream edge of Mullholland Highway



Recommendations:

If clearing must be done, it should be done in a way that does not impact the two large pools of water upstream of Mulholland, and does not degrade the cobble bottom of the creek. If necessary, only the vegetation in the center of the channel should be removed by hand and the vegetation on the banks should remain for slope stability and habitat value. Roots of the sycamores holding up the banks of the bridge should be protected from compaction and fencing placed around the perimeter of the roots if mechanical clearing is utilized.

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Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site #29 Las Virgenes Creek at the Ventura County Line to 3006' upstream of Thousand Oaks Blvd.

Las Virgenes Creek flows out of Ventura County at Ahmanson Ranch, and eventually into a box culvert behind apartment buildings. Until it reaches the box culvert, the stream is natural. The stream reach proposed for clearing is the natural part of the stream from the Ventura County line to the culvert. The canopy is estimated at 10% and there are approximately 30 willows 4" DBH or greater. Numerous cattails line the channel. Tree frog tadpoles have been observed previously at this site. Similar to Las Virgenes Creek further downstream, the biological assessment by Michael C. Long in Appendix A would apply here as well. There is also a large Valley Oak in need of protection on the upper streambank.

Recommendations:

Selective hand thinning of willows only near the Ventura County Line should reduce any threat of flooding to the nearby apartment buildings, since the creek drops in elevation rather quickly and the canopy naturally thins out. If the site cannot be taken off the list completely, at a minimum the scope should be significantly decreased.

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site #34 Medea Creek 535' downstream of Kanan to 940' downstream of Kanan.

A mature riparian habitat, this site connects to site #35 under the 101 freeway. The canopy is 75% or greater, and in addition to mature willows (at least 100 greater than 4" DBH), the site also contains sycamores, cottonwoods, significant oak trees, and understory habitat. While there is considerable development upstream and the stream is channelized, at this location the creek is natural and surrounded by open space. Similar to Las Virgenes Creek at Lost Hills Road but more mature, Michael C. Long's biological assessment in Appendix A applies here as well. This site is certainly serving as an important riparian habitat to the surrounding hills as well as an important wildlife corridor.

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site #34 Medea Creek 535' downstream of Kanan to 940' downstream of Kanan.

Recommendations:

Unless it can be shown specifically where the flood damage my threaten improved property, no clearing should take place and if necessary, allow the area to flood into the surrounding open space.

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site #37 Medea Creek/Cheseboro Creek Outlet: 614' downstream of Agoura Road to 784" downstream of Agoura Road.

The confluence of Medea Creek and Cheseboro Creek are two box channels coming into a larger box channel. Downstream of this, the creek becomes natural again, and this is the site proposed for clearing. While not directly accessible, it was easily observed to be a mature riparian habitat with at least 20 willows 4" DBH or greater, and at least 2 significant Valley Oaks. Canopy cover is estimated at 50%. This would make excellent bird breeding habitat in spring.

Recommendations:

Selective thinning to open the stream where the flow from the box culverts enters may be necessary to avoid flooding upstream, but ultimate care should be taken to preserve as much as the habitat as necessary. Due to the mature nature of the habitat, and the significance the roots play in streambank stability, roots of the mature trees should be protected from compaction, and fenced off. Similar to Las Virgenes Creek, Michael C. Long's biological assessment applies.

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site #36 Cheseboro Main Channel Inlet: 100' upstream of Driver Ave. to 44' upstream of Driver Ave.

The creek here is natural before it flows under Driver Ave. and into a box channel. While not as mature a habitat and not as diverse as some of the other locations listed above, the site nonetheless contains approximately 40 willows of 4" DBH or greater and small Valley Oaks were observed. It has a canopy cover of 60%. The willows perform another very important function at this site. Surrounding the creek, and further upstream are numerous equestrian facilities that contribute significant amounts of nutrients and coliform bacteria from horse manure. Water quality testing in November 1994 and January 1995 confirms this. The willows are undoubtedly performing as filter strips in both holding back the waste from entering the creek, and taking up the nitrogen once it does enter. The main part of the channel on the day we observed it was dry, and little or no vegetation was actually in the center of the channel.

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site #36 Cheseboro Main Channel Inlet: 100' upstream of Driver Ave. to 44' upstream of Driver Ave.

Recommendations:

We do not see the need for any clearing at this site since the main channel is open, and the area immediately surrounding the space is an equestrian park. Due to the importance of nutrient uptake, removal of the vegetation could seriously degrade the water quality at the site and downstream.

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site #32 Stokes Canyon: Intersection of Quad Sheet blue line with the eastern boundary of Section 6, Township 1S, Range 17W to 1600' upstream of the intersection of Mulholland Highway.

Arundo donax was observed only at this location. This stream has been reinforced with gabions, and many willows hold up the banks. The number of willows 4" DBH or greater is estimated at 50, and the canopy cover is approximately 20%. Much of this habitat burned in the Calabasas fire last year, and many willows were killed as a result. Nonetheless, the willow roots are still performing bank stability. Numerous coyote and rabbit tracks were observed on the day we visited. The substrate here consists of mixed cobbles, sands, and finer sediments. The creek is surrounded by larger homes, many containing equestrian facilities.

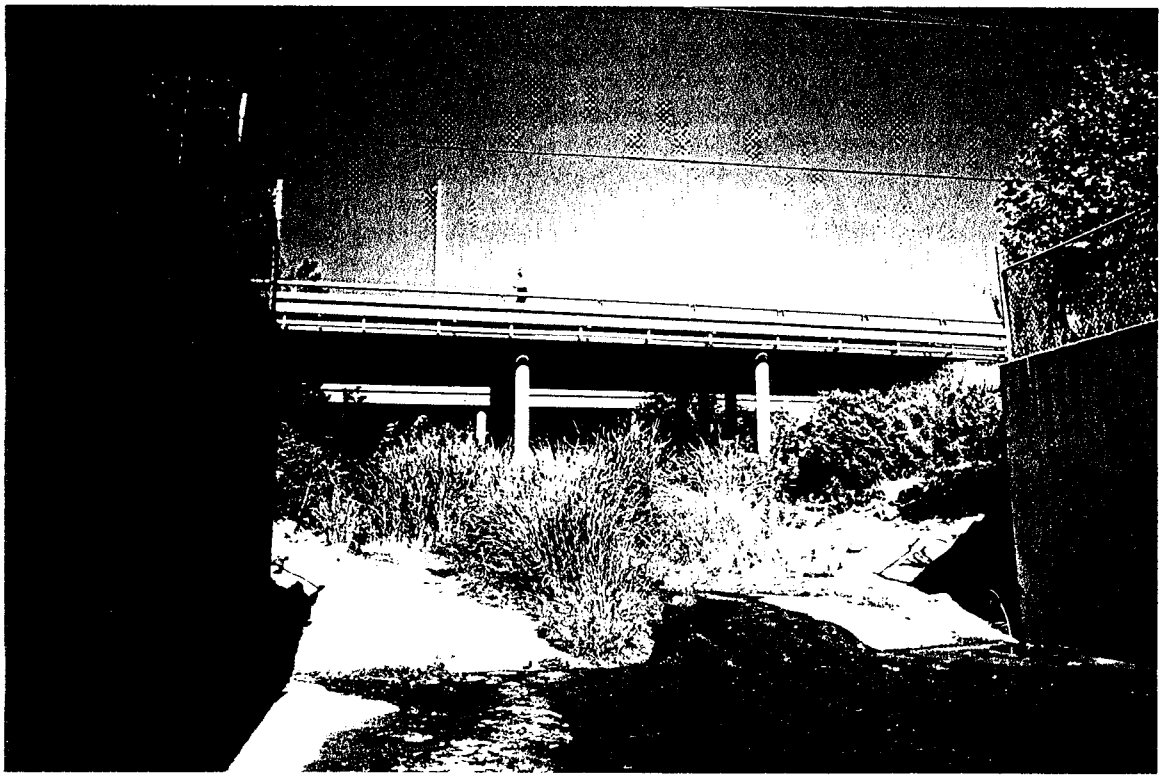
Recommendations:

There seems to be no need for clearing at this time since the fire last year reduced so much vegetation anyway. In many place the banks appear unstable, and removing vegetation here could serve to de-stabilize the banks further, and create even more significant problems to property owners. Removal of only the arundo is recommended.

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site # 35 Medea Creek Main Channel Inlet Under 101: 98' upstream of the upstream side of Roadside Drive to 13' upstream of the upstream side of Roadside Drive.

This site runs under the 101 freeway from frontage roads on either side of the 101 freeway Percent cover is not applicable due to the freeway. Numerous cattails and willows are in the creek. On the north side of Roadside Drive a mature riparian habitat exists (see site # 34) and there are several deep pools that could be southwestern pond turtle habitat or tree frog breeding habitat. On the far south side, there is a Valley Oak on one side and a Coast Live Oak on the other side of the crossing that are holding up the stream bank.



Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site #30 Las Virgenes Creek under Agoura Road

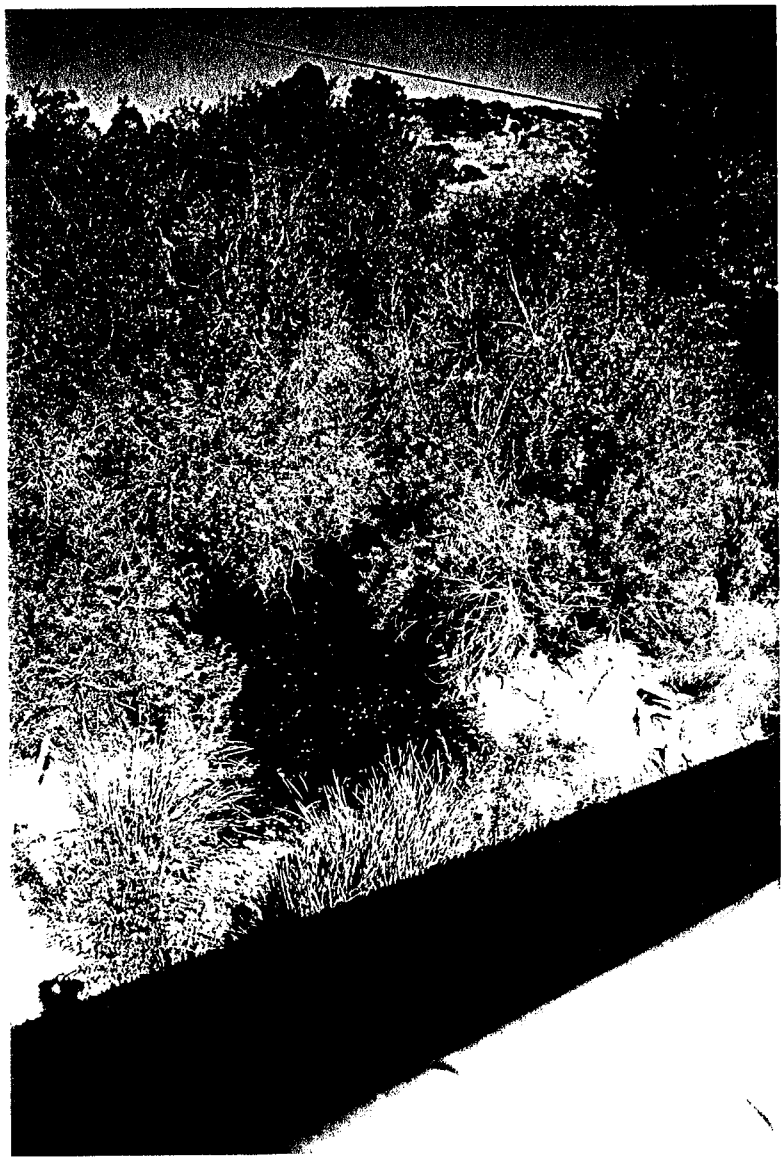
A trapezoidal channel is upstream of Agoura Road; under the road the channel contains rip-rap. The channel is then natural, with a canopy of approximately 60%. Under the road however, no trees are performing bank stability, and there is very little habitat of any value. Cattails and watercress are in the stream.

Recommendations:

This site could be mechanically cleared with very little impact, as long as the clearing is confined to only under the road. Once past the road however, it significantly changes and is part of Michael C. Long's biological assessment study area (see appendix A).

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site # 35 Medea Creek Main Channel Inlet Under 101: 98' upstream of the upstream side of Roadside Drive to 13' upstream of the upstream side of Roadside Drive.



Recommendations:

Mechanical clearing is acceptable if confined to under the freeway. At the frontage roads, trees are performing bank stability and their roots should be protected from compaction and fenced off for protection during clearing activities. Due to the deep pools and mature habitat, we do not recommend clearing upstream of the upstream side of Roadside Drive.

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site #33 Medea Creek: 731' upstream of Thousand Oaks Blvd. to 215' upstream of Thousand Oaks Blvd.

Bounded by concrete walls on both sides, vegetation only occurs in the bottom of the channel. On the upstream half of the area, there is no canopy, on the bottom half, canopy is estimated at 20% with approximately 6 willows 4" DBH or greater. Most of the vegetation consists of cattails. The substrate consists of fine sediments. Many non-native mosquitofish were observed in the stream. This site is the one pictured in the L.A. Times article on channel clearing. Habitat value here is low.

Recommendations:

Mechanical clearing would have very little impact on habitat since it is already so depauperate in biodiversity. Development bounds both sides of the channel, increasing the need for flood protection.

Resource Conservation District of the Santa Monica Mountains
Biological Overview of the Malibu Creek Watershed Proposed Channel Clearing Sites

Site #38 Lindero Canyon: 83' downstream of Agoura Road to 270' downstream of Agoura Road.

This site had only algae and watercress (less than 8" high) in the creek channel. It is bounded by concrete walls, has no canopy, and a silty substrate. It provides virtually no habitat value

Recommendations:

This site appears not to have any vegetation, thus no clearing is needed.

Appendix A
Sensitive Species Survey for Las Virgenes Creek, Lost Hills Road and Cold Springs Street, Calabasas, Los Angeles County, Califonia

Prepared by
Michael C. Long, Consulting Biologist

SENSITIVE SPECIES SURVEY FOR LAS VIRGENES CREEK, LOST HILLS ROAD BETWEEN MEADOW CREEK LANE AND COLD SPRINGS STREET, CALABASAS, LOS ANGELES COUNTY, CALIFORNIA

Prepared for:
Topanga-Las Virgenes Resource Conservation District
122 North Topanga Canyon Blvd., Topanga, California 90290

Prepared by:
Michael C. Long, Consulting Biologist
6128 N. Reno Ave.
Temple City, California 91780

METHODS

The area proposed for restoration along Las Virgenes Creek, City of Calabasas was surveyed for the presence of sensitive (i.e. Agency-listed) species. The site is along Lost Hills Road between Meadow Creek Lane and Cold Springs Street. Survey work extended approximately one quarter mile upstream and downstream of the project boundaries to include possible secondary effects of project work. The site was visited and surveyed three times during spring and early summer: March 17, May 13 and June 23, 1995. Bird species were surveyed with the aid of binoculars. The presence of mammals, reptiles, amphibians and sensitive plants was determined by slow, walking surveys, scanning vegetation, turning logs, rocks and other cover and looking for tracks, scats and burrows. Records for sensitive species from the California Department of Fish and Game, Natural Diversity Data Base (NDDB) and "Special Plants" and "Special Animals" Lists were consulted to determine the possible presence of species on or near the site. In addition to surveying for the presence of sensitive species, the suitability of the habitat to support such species was assessed.

Survey work was conducted during spring and early summer months in order to include migrant and summer resident bird species as well as year-round residents. This also includes the period of spring activity by other vertebrates. The area was surveyed with emphasis on early morning visits to sample the peak period of bird activity.

This report summarizes any sensitive species seen or reasonably expected to occur and includes recommendations for eliminating or minimizing potential impacts of the restoration project to sensitive species.

HABITAT DESCRIPTION

The major feature of the site is the semi-permanent creek flowing north to south. The riparian habitat along the immediate creek bed and lower slopes is dominated by willows (*Salix lasiolepis* and *S. laevigata*), both mature trees to approximately 40 feet high and others of shrubby stature 15-20 feet high. The creek bed also supports stands of

mulefat (*Baccharis salicifolia*) and California rose (*Rosa californica*). A small coast live oak (*Quercus agrifolia*) and several young black walnuts (*Juglans californica*) are found on the east bank and toward the north of the site respectively. The riparian community best fits the description of Southern Willow Scrub from Holland (1986).

Both banks of the creek are dominated by coastal sage scrub, with black sage (*Salvia mellifera*) and California sagebrush (*Artemisia californica*) being most common. Additional species here are deerweed (*Lotus scoparius*), flat-topped buckwheat (*Eriogonum fasciculatum*), bush monkeyflower (*Diplacus aurantiacus*) and golden yarrow (*Eriophyllum confertiflorum*). This coastal sage scrub is best characterized as Venturan Coastal Sage Scrub from Holland (1986). Open spaces on the slopes support weedy species such as black mustard (*Brassica nigra*), red brome (*Bromus madritensis rubens*), yellow sweet-clover (*Melilotus indica*), ripgut grass (*Bromus diandrus*), filaree (*Erodium cicutarium*), yellow star thistle (*Centaurea melitensis*) and bull thistle (*Cirsium vulgare*). The face of the steep bank cut (actively eroding) at the center of the project site is mostly bare of vegetation. There are scattered clumps or individual plants of red brome, soft chess (*Bromus mollis*), black mustard, star thistle and lamb's quarters (*Chenopodium murale*).

The disturbed flat to the west of the creek, between Lost Hills Road and the west bank of the creek, is apparently disced regularly for weed abatement and fire control, and was disced sometime between the second and third visits to the site. This flat is dominated by weedy, mostly non-native annuals. Dominant species are red brome, soft chess, yellow sweet-clover, wild oat (*Avena fatua*) and filaree. Other common species include black mustard, sow-thistle (*Sonchus oleraceus*), foxtail (*Hordeum sp.*), ripgut grass, annual beard grass (*Polypogon monspeliensis*), yellow star thistle, prickly lettuce (*Lactuca serriola*), California burclover (*Medicago polymorpha*), horseweed (*Conyza canadensis*), annual lupine (*Lupinus succulentus*), tarplant (*Hemizonia fasciculata*) and scarlet pimpernel (*Anagalis arvensis*).

FAUNA RECORDED

Bird species and numbers recorded during the survey are listed in Table 1. A total of 31 species were observed. Some species were seen only overhead (i.e. turkey vulture, red-tailed hawk, ring-billed gull, swallows) and did not appear to be directly utilizing the site. Only 9 species were seen on all three visits. A number of resident species were clearly nesting in the riparian woodland. Young with parents attending were seen for black phoebe and song sparrow, and most other species observed in the area on the June 23 survey were presumably nesting locally.

Mammals seen were California ground squirrel (*Spermophilus beecheyi*), Audubon's cottontail (*Sylvilagus audubonii*), and tracks of raccoon (*Procyon lotor*) and skunk (*Mephitis mephitis*) and mule deer (*Odocoileus hemionus*) were observed along the creek bed and west slope.

The only reptiles observed were several western fence lizards (*Sceloporus occidentalis*) and a single side-blotched lizard (*Uta stansburiana*). No amphibian species were seen during the surveys.

The only fish species noted were mosquito fish (*Gambusia affinis*) in the flowing creek.

SENSITIVE SPECIES

Table 2 lists sensitive (i.e. Agency-listed) species with records of occurrence in the Calabasas area, from the California Natural Diversity Data Base or those thought to be potentially occurring at the site based on distribution and habitat. A number of species from the NDDB were considered but not listed due to lack of any suitable soil or rock type substrate (i.e. Conejo buckwheat) or lack of suitable roosting sites (i.e. California Leaf-nosed Bat). Many of the remaining species listed would be highly unlikely to occur at the Las Virgenes Creek site due to lack of suitable habitat or proper community, or highly limited distribution of some species.

Of those sensitive species listed as potentially occurring at the site, only two, white-tailed kite (*Elanus caeruleus*) and yellow warbler (*Dendroica petechia*) were seen during the surveys. A single white-tailed kite (State Fully-protected) was observed perched in the top of a tree in the riparian area west of the school yard, approximately 1/4 mile north of the project site on March 17, 1995. This individual was not seen on the two subsequent visits and may have been dispersing to or from other suitable nesting habitat.

Two yellow warblers, (California Species of Special Concern), were observed feeding in the tops of willows near the middle of the project site on May 13. These birds were seen in the period when migrants would be expected passing through the lowlands of southern California and were not observed on the later visit (June 23) when nesting by this species might be expected. The yellow warbler has become rare as a nesting species in lowland Los Angeles County and nests more commonly in foothills and higher elevation riparian woodlands. It is assumed that the individuals seen, and other migrants, utilize the riparian site as a stopover for feeding and resting during migration.

Although trapping for small mammals was not conducted, review of the sensitive species list indicated none considered as possibly occurring in the vicinity, or for which suitable habitat was available at the site.

RECOMMENDATIONS FOR MINIMIZING POTENTIAL PROJECT IMPACT

While no State or Federally-listed Rare, Endangered or Threatened species were found during the survey, or are considered likely to occur at the site, the riparian woodland (Southern Willow Scrub) along the creek bed has high value as wildlife habitat. The two sensitive bird species observed on or near the site (white-tailed kite and yellow warbler) were utilizing this mature willow community, although both appeared to be seasonal visitors only. In order to avoid impacts to nesting bird species the seasonal window for conducting restoration work would be early-September through mid-February.

During restoration work along the west bank, every effort should be made to minimize

direct disturbance to the riparian vegetation in the creek bed and along the east bank of the creek. The project, as proposed, to terrace and stabilize the steep, badly eroded west bank of the creek and restore native riparian and/or coastal sage scrub vegetation, should enhance the wildlife values of the site.

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TABLE 1 - BIRDS OBSERVED AT LAS VIRGENES CREEK SITE, CALABASAS

NAME	Mar 17 95	May 13 95	Jun 23 95
TIME:	0945-1115	0715 - 0945	0730-0930
Mallard	3	2	
Turkey Vulture	2 (O.H.)	7 (O.H.)	2 (O.H.)
White-tailed Kite	1		
Red-tailed Hawk	1 (O.H.)	1 (O H.)	1 (O.H.)
Ring-billed Gull	40-45 (O.H.)		
Rock Dove			2
Band-tailed Pigeon			15 (O.H.)
Mourning Dove	3	4	5
Costa's Hummingbird		1	
Anna's Hummingbird	3	2	3
Downy Woodpecker			1
Black Phoebe	2	5 (4 juvs.)	3
Rough-winged Swallow		3 (O.H.)	
Barn Swallow		1 (O.H.)	
Cliff Swallow		45-50 (O.H.)	40-45 (O.H.)
Scrub Jay		1	2
Common Raven	2	8	3
American Crow	6	6	7
Plain Titmouse		2	2
Bushtit		1	2
Bewick's Wren			2
House Wren			1
European Starling		5 (O.H.)	3 (O.H.)
Yellow Warbler		2	
Yellow-rumped Warbler	4		
Song Sparrow	2	8 (2 juvs.)	5
California Towhee	1	4	3
Brewer's Blackbird		1 (O.H.)	20-25
Lesser Goldfinch		3	5
House Finch	5	12	3
House Sparrow		3	

(O.H.) = overhead only

TABLE 2 - POTENTIAL SENSITIVE SPECIES - LAS VIRGENES CREEK SITE, CALABASAS

Common Name	*Scientific Name*	USFWS	CDFG	CNPS
PLANTS				
Braunton's milk-vetch	*Astragalus brauntonii*	C2		1B
Conejo dudleya	*Dudleya abramsii ssp. parva*	C1		1B
Blochman's dudleya	*Dudleya b. ssp. blochmaniae*	C2		1B
Santa Monica Mtns. dudleya	*Dudleya cymosa ssp. marcescens*	C2	R	1B
Santa Susana tarplant	*Hemizonia minthornii*	C2	R	1B
Lyon's pentachaeta	*Pentachaeta lyonii*	C2	E	1B
ANIMALS				
Southwestern Pond Turtle	*Clemmys marmorata pallida*	C2	CSC	
San Diego Horned Lizard	*Phrynosoma coronatum blainvillei*	C2	CSC	
Coastal Western Whiptail	*Cnemidophorus trigris multiscutatus*	C2		
Coast Patch-nosed Snake	*Salvadora hexalepis virgultea*	C2	CSC	
San Diego Mountain Kingsnake	*Lampropeltis zonata pulchra*	C2	CSC	
White-tailed Kite	*Elanus caeruleus*		SFP	
Northern Harrier	*Circus cyaneus*		CSC	
Sharp-shinned Hawk	*Accipiter striatus*		CSC	
Cooper's Hawk	*Accipiter cooperii*		CSC	
Golden Eagle	*Aquila chrysaetos*		CSC	
Western Yellow-billed Cuckoo	*Coccyzus americanus occidentalis*		E	
Burrowing Owl	*Athene cunicularia*		CSC	
Black Swift	*Cypseloides niger*		CSC	
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	T	E	
Bank Swallow	*Riparia riparia*		T	
Loggerhead Shrike	*Lanius ludovicianus*	C2	CSC	
Least Bell's Vireo	*Vireo bellii pusillus*	E	E	
Yellow Warbler	*Dendroica petechia brewsteri*		CSC	
Yellow-breasted Chat	*Icteria virens*		CSC	
Tricolored Blackbird	*Agelaius tricolor*	C2	CSC	
So. Calif. Rufous-crowned Sparrow	*Aimophila ruficeps canescens*	C2	CSC	
San Diego Black-tailed Jackrabbit	*Lepus californicus bennettii*	C2	CSC	
American Badger	*Taxidea taxus*		CSC	

USFWS = United States Fish and Wildlife Service
CDFG = California Department of Fish and Game
CNPS = California Native Plant Society

KEY TO TABLE 2 - SENSITIVE SPECIES

USFWS	United States Fish and Wildlife Service
CDFG	California Department of Fish and Game
CNPS	California Native Plant Society

C1	Federal Category 1; Species for which there is sufficient biological information to support a proposal to list as Endangered or Threatened.
C2	Federal Category 2; Species for which existing information indicates a listing may be warranted, but for which substantial biological information to support a proposed rule is lacking.
E	Endangered; Species is in immediate danger of extirpation or extinction from existing pressures.
T	Threatened; Species not presently threatened with extinction, but is likely to become an endangered species in the forseeable future in the absence of special protection and management efforts.
R	California Listed Rare; native plant, although not presently threatened with extinction, is in such small numbers throughout its range that it may become endangered if its present environment worsens.
CSC	CDFG Species of Special Concern; native species thought to warrant monitoring due to declining population numbers.
1B	CNPS Priority List 1B; plant rare, threatened, or endangered in California and elsewhere; eligible for state listing.
SFP	State Fully Protected; by special ordinance or statute.

Appendix B
Hydraulic Impact Study Las Virgenes Creek Bank Revegetation and Stabilization

Prepared by
Martin Kammerer, Hydrologist, Geomorphologist
Resource Conservation District of the Santa Monica Mountains

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Hydraulic Impact Study

Las Virgenes Creek: Bank Revegetation and Stabilization

Content:

1. Project Description The purpose of the proposed work is to recontour and revegetate a 200 ft long bank portion of the Las Virgenes Canyon Floodway. The stream channel was negatively impacted by high flood flows in the past five years. The western bank was undercut and eroded to form a steep, bowl-shaped cutbank approximately 30 ft in height. The proposed project is needed because continued erosion introduces large amounts of fine sediment into the stream system, and because continued erosional retreat of the bank may threaten to damage existing structures (i.e. the adjacent roadway and sidewalk). The project is funded by an EPA Section 319 (h) Grant to the State Water Resources Control Board. Our agency acts as a contractor under this grant.

2. Site Description

The project site is located within the Malibu/Las Virgenes Creek Watershed (Los Angeles County) with a contributing basin area of 29 square miles at the site. It is located along the eastern side of Lost Hills Road between Meadow Creek Lane and Cold Springs Street in the City of Calabasas (Figure 1 and 2).

The project site is a 200 ft long stretch of the right bank of Las Virgenes Creek. It is part of the Las Virgenes Canyon Floodway, which was designed by L.A. County Dept. of Public Works to protect adjacent developments. The floodway routes flood water from the upper catchment areas under Freeway 101 into the undeveloped portions of Las Virgenes Canyon. It consists of a number of concrete box-channels connected by earthen trapezoidal channels with 3:1 bank slopes. The project site is a small bank portion of an earthen part of the floodway. The channel was designed for a 50-year design flood of 15,900 cfs. This flow was determined using the Modified Rational Method currently used in L.A. County (Dept. of Public Works, 1983, Memo regarding Las Virgenes Canyon Floodway, Nomenclature Nr. 2-2061).

Channel bottoms in this area are heavily vegetated by willow and other tree species. The banks show little vegetation, probably due to compaction of the soil during construction of the channel. The bank slopes consist of gravelly fill and portions of the banks were stabilized by placement of boulder rip-rap and the construction of a concrete wing deflector.

Figure 1. Site Location

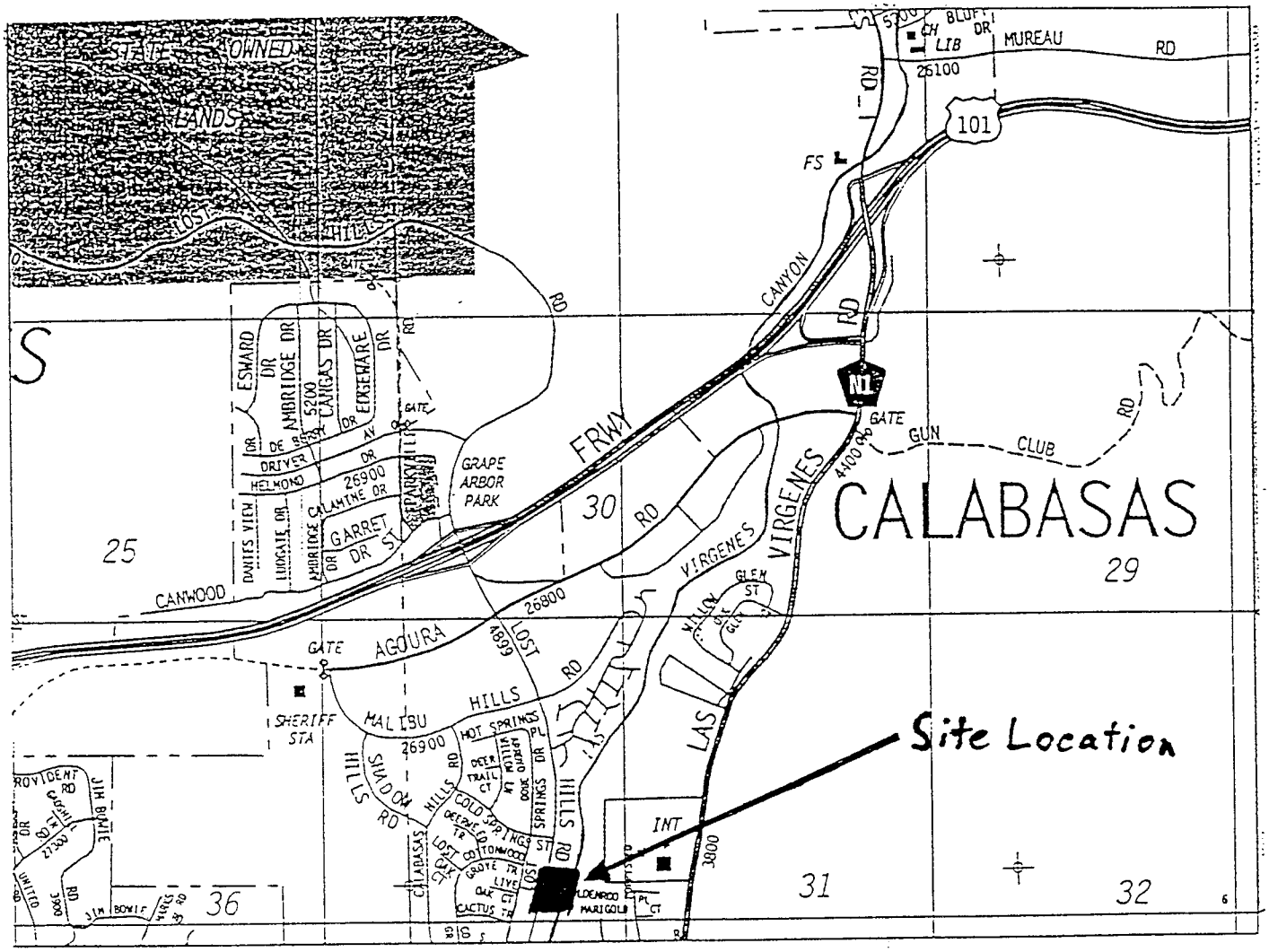
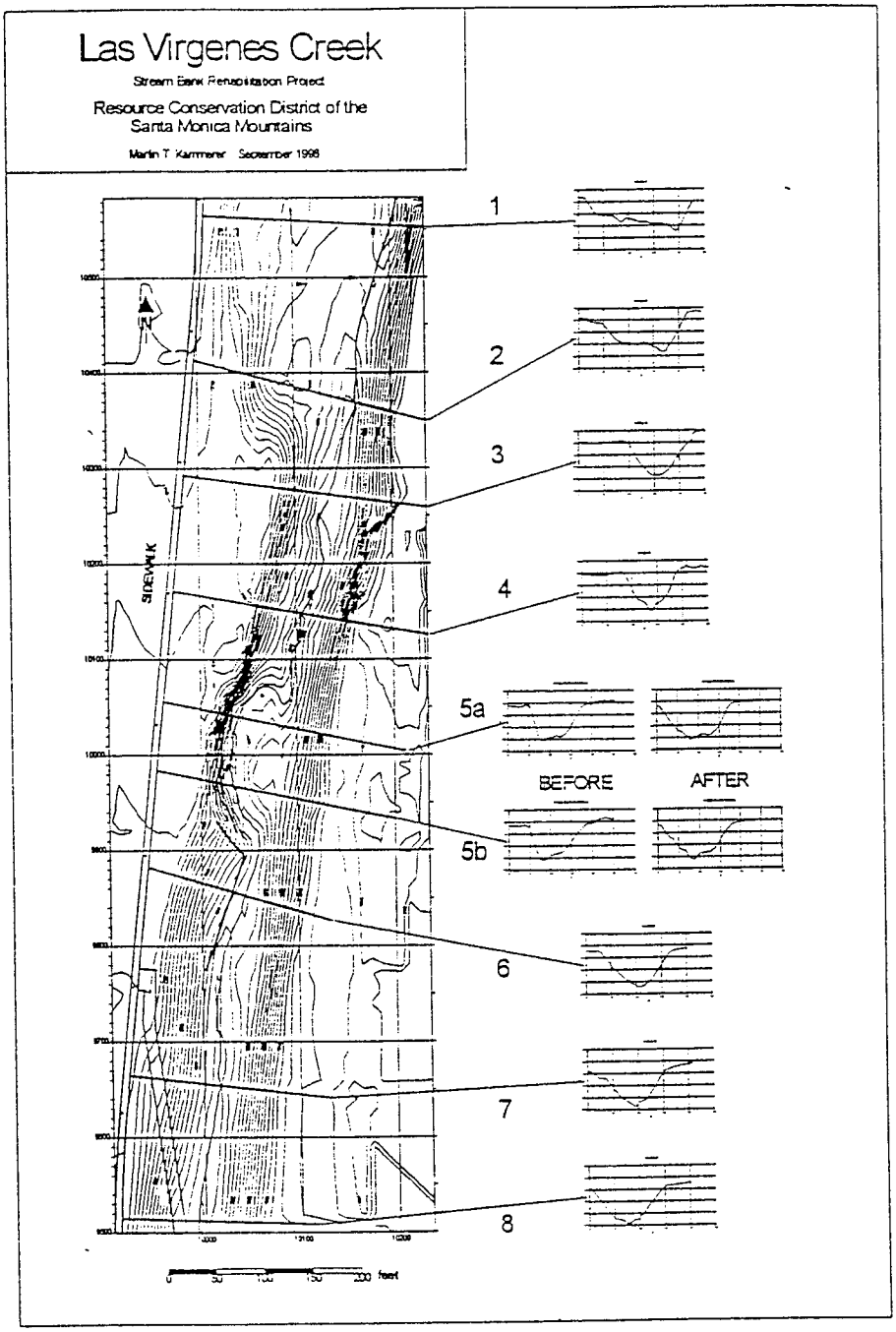


Figure 2. Topographic Map



The low-flow channel in this reach is made up of primarily gravel. It is irregular in shape and 10-30 ft wide. The channel consists of a series of riffles and pools and the stream exhibits some tendencies to establish alternate bars. Channel incision is apparent in many areas which results in more triangular channel cross-sections and variations of bed slopes. The channel slope is on the order of 0.015 ft/ft.

3. Design Criteria

The project requires the stabilization of a steep cutbank with a slope steeper than 1:1. Any discharge of fill into existing channel portions and removal of vegetation in the channel is to be avoided. Recontouring of the cutbank to a shallower bank slope is physically limited by the proximity of a sidewalk and roadway.

It is suggested to regrade the bank to a slope approximating 3:1. This shall be accomplished by excavation and removal of the existing fill without deposition of any materials at the site. Bio-engineering principles are to be used to stabilize the new slope. Erosion blankets will be installed and the area will be revegetated using native plant species. Two terraces will be formed by excavation and these breaks in slope will be planted with native wood species (Figure 3)

From a hydraulic perspective, the proposed alteration of the channel is a widening over a length of 200 ft without changes to the existing channel slope. Adverse effects to water surface elevations during flood flows are likely to be small because channel capacity is increased.

Figure 3. Block Diagrams of Proposed Changes

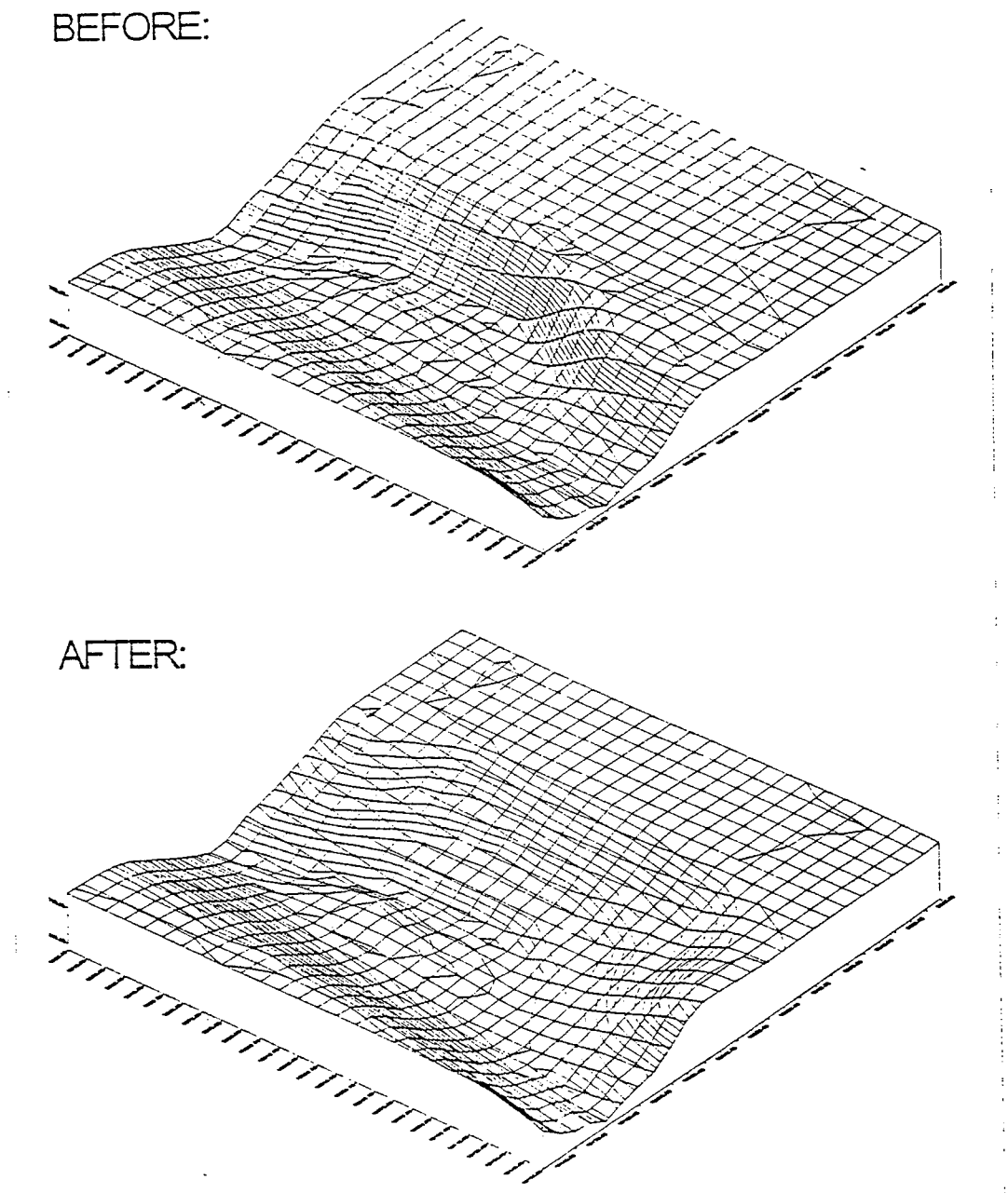
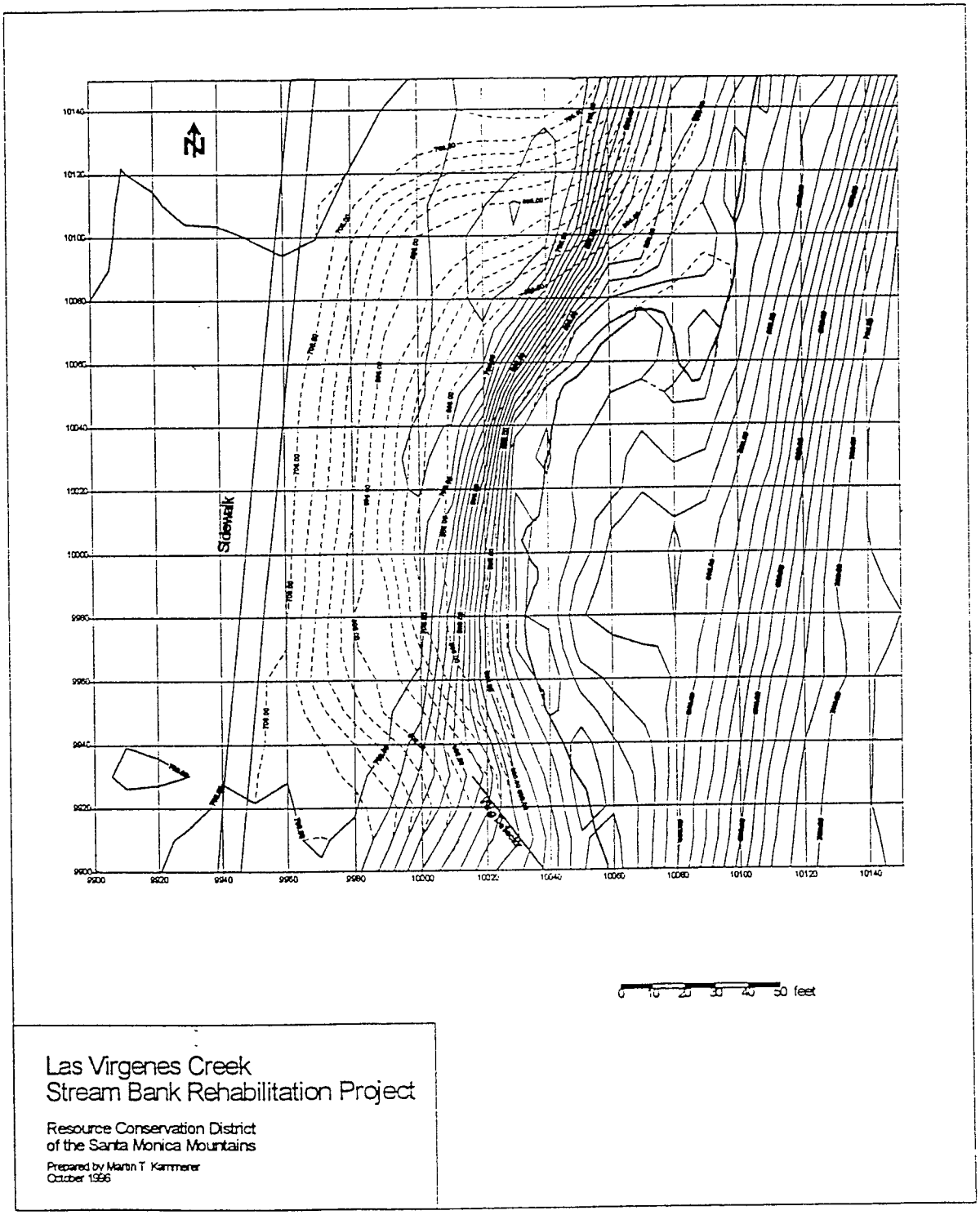


Figure 4. Grading Plan



4. Water Surface Modelling

In order to determine possible adverse effects, water surface elevations were modelled using HEC-RAS computer software. Specifically, the goal was to compare the water surface profile of a 50 year design flood (15,900 cfs) for the existing channel with the proposed channel.

In total, nine evenly spaced cross-sections where used along a stream reach of 1000 ft. length. The project site consists of two Sections in the center of this model reach (Section 5a / River Station 452 and Section 5b / River Section 451). Cross-sections were surveyed using standard surveying instruments. The first model-run was performed using existing conditions. In the second run the geometry of the two cross-sections at the project site where substituted by cross-sections interpolated from the grading plan (Figure 4).

Both, Chow's (1959) method, and Barnes' (1967) method were used for the determination of Manning's roughness coefficient (n). A value of 0.070 was estimated for the heavily vegetated channel bottoms. The less vegetated banks were estimated to have a value of 0.040. The bank portions of the channel were modelled as overbanks in order to more accurately reflect the roughness differences between channel floor and slopes.

The two model runs employed the "mixed flow" procedure available in HEC-RAS which allows the simultaneous modelling of sub and supercritical profiles. Boundary conditions specified for the beginning and ending cross-sections where determined using the normal-depth procedure by assuming the water surface slope to equal the bed slope of 0.015.

Modelling results show that under the existing and the proposed conditions the water surface will stay well within the boundaries of the trapezoidal channel at a discharge of 15,900 cfs (see Appendices A and B).

An interesting outcome is the existence of a short stretch of critical to supercritical flow at Section 4 (River Station 504). This transition is likely caused by a reduction of cross-sectional area (30%) from Section 3 River Station (603) to Section 4, and resulting in a M2 drawdown curve. Flow is close to critical at cross-section 4 and goes back to subcritical at the transition to the project area (Sections 5a and 5b) taking the form of a C1/S1 backwater curve.

This brief transition to critical/supercritical flow and back to subcritical flow may have had the form of a hydraulic jump during some of the past floods. The resulting turbulent energy expenditure may have been the cause for the observed bank erosion at the project site through

development of strong secondary flow-components, lateral surface-wave propagation,and eddy-recirculation.

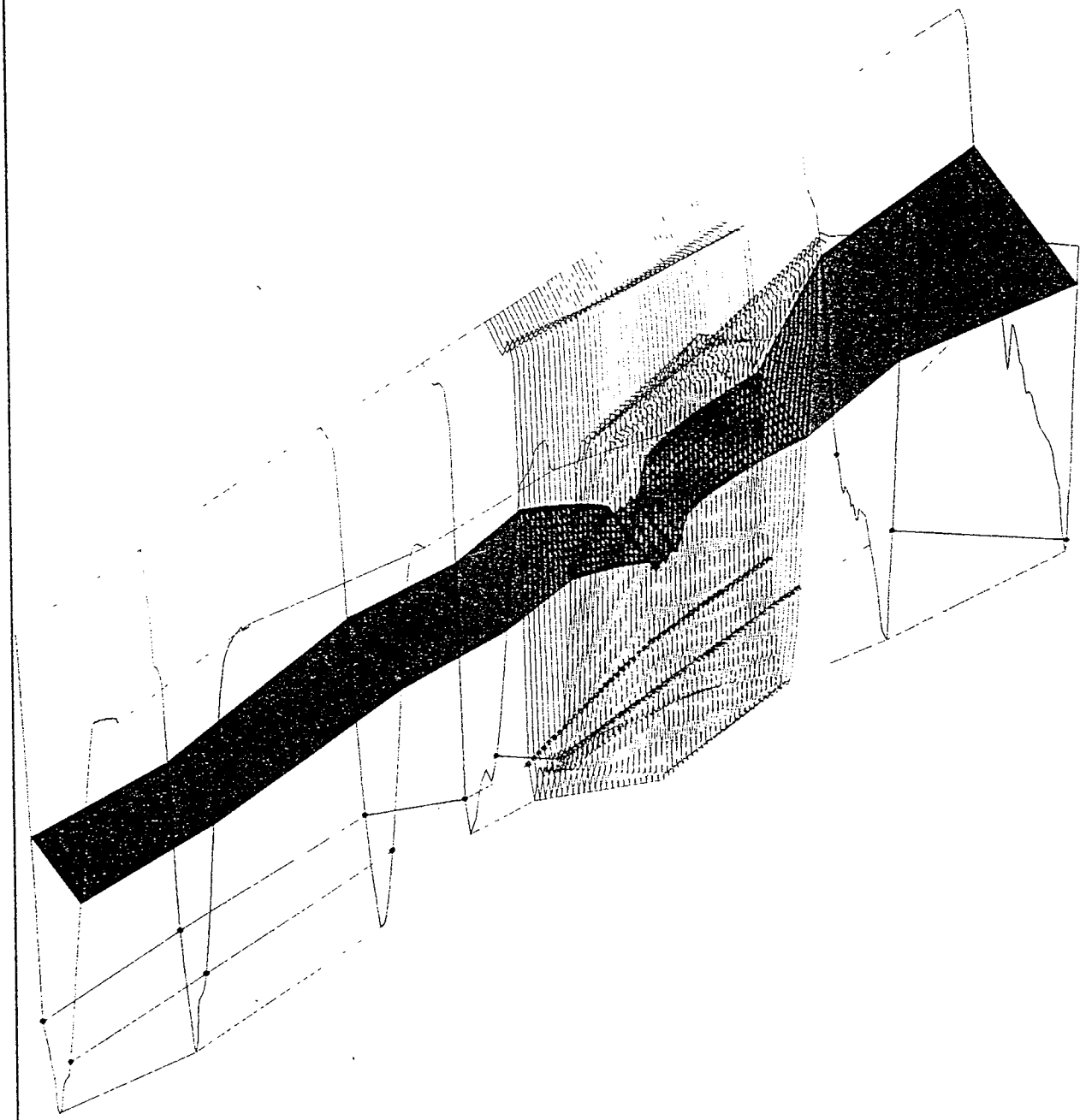
The described flow transition is attributable to the flow constriction between Section 3 and 4 and equally exists for both flow scenarios. Therefore, possible adverse effects by this flow transition are unrelated to the proposed project. Water surface elevations in the project area (Sections 5a and 5b) differ by less than one foot between the two scenarios and no differences can be found for the water surface elevations for the cross-sections in down- and upstream direction.

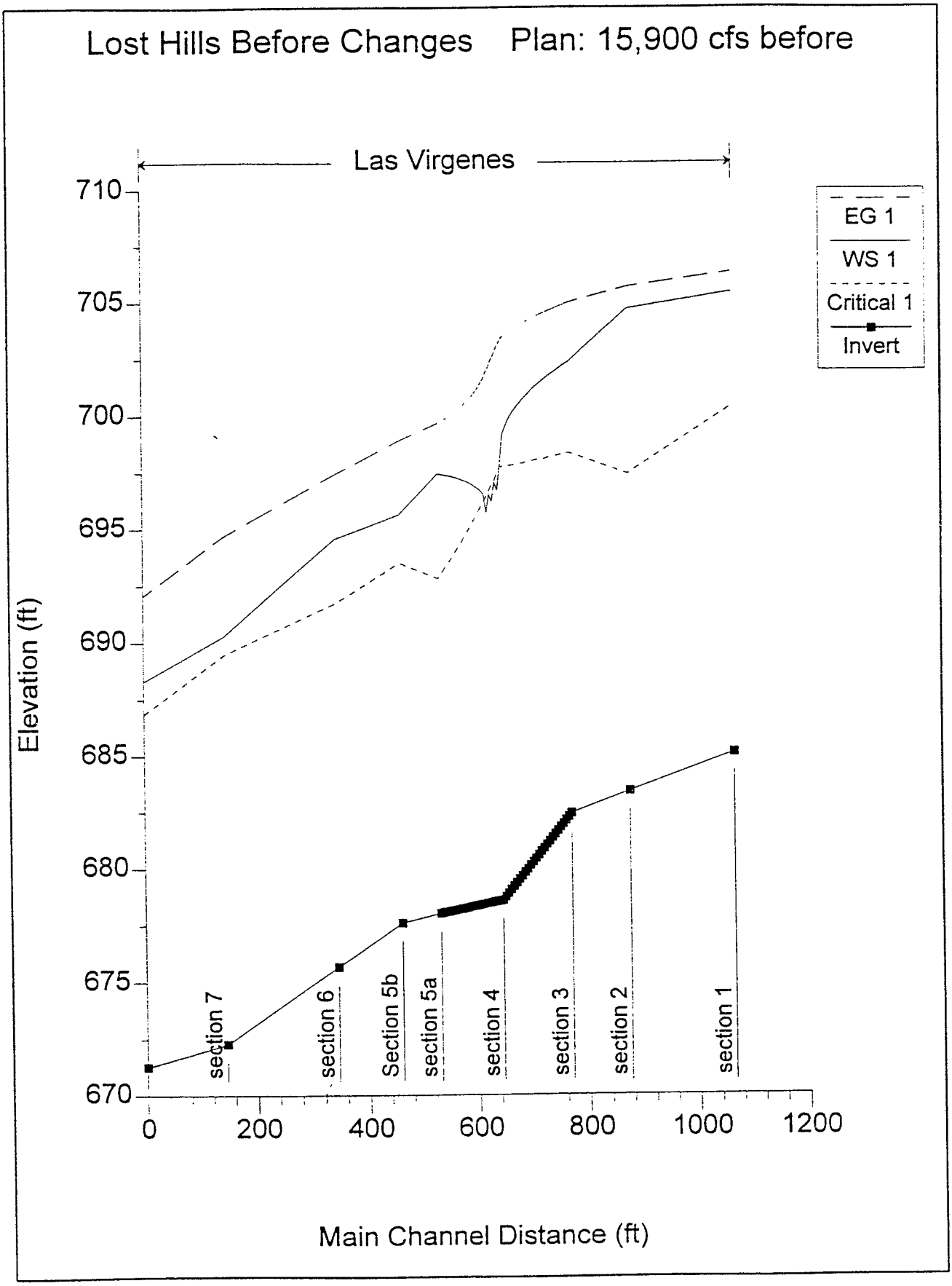
5. Conclusion and Recommendation

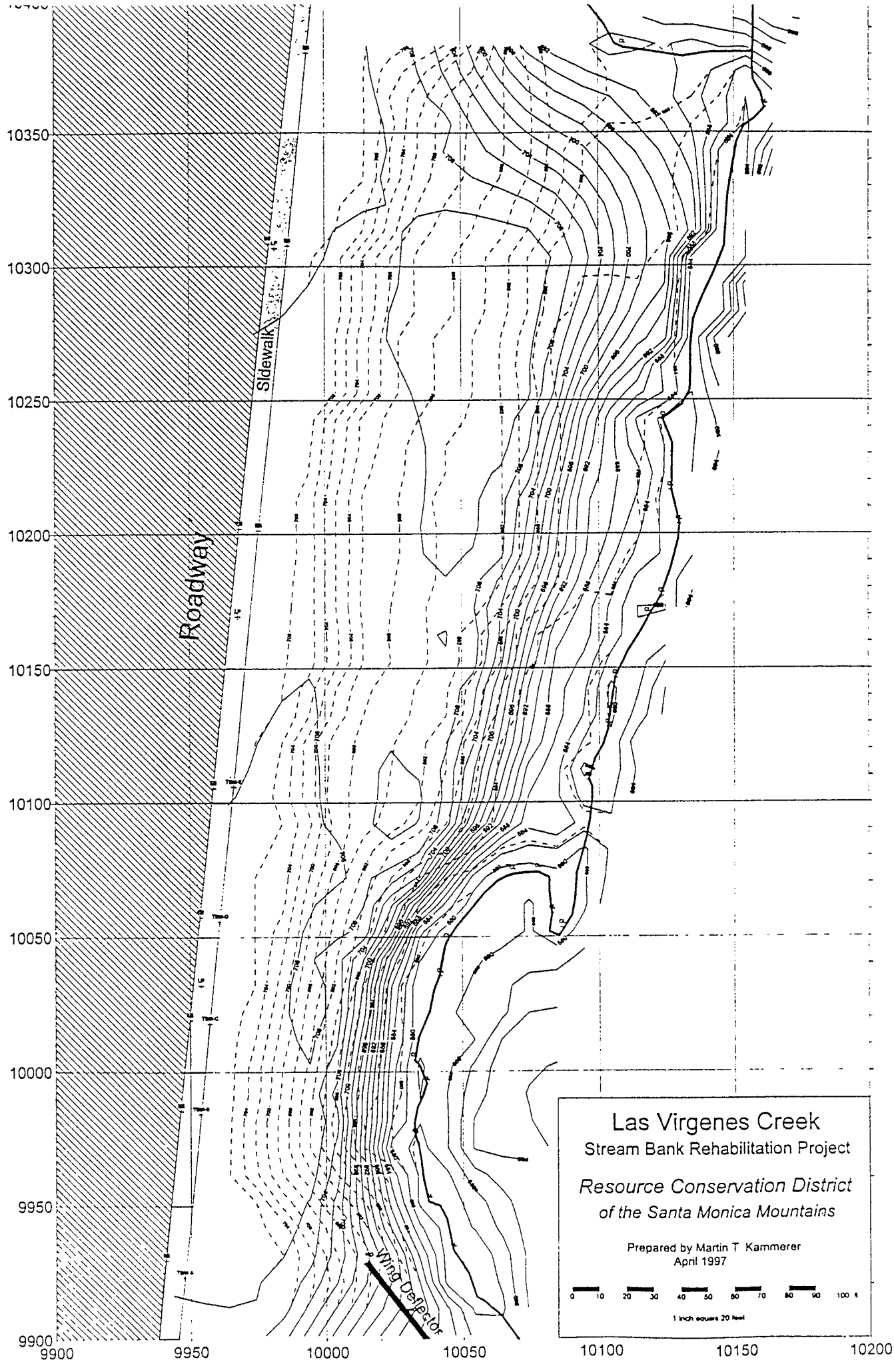
The described HEC-RAS water surface analysis shows that no significant changes of hydraulic conditions should be expected by the completion of the proposed project. The results further indicate that the channel constriction imposed by Section 4 may be the cause of the bank erosion in the project area. The feasability of an extention of the project in upstream direction with the goal of also increasing the width of section 4 should be investigated.

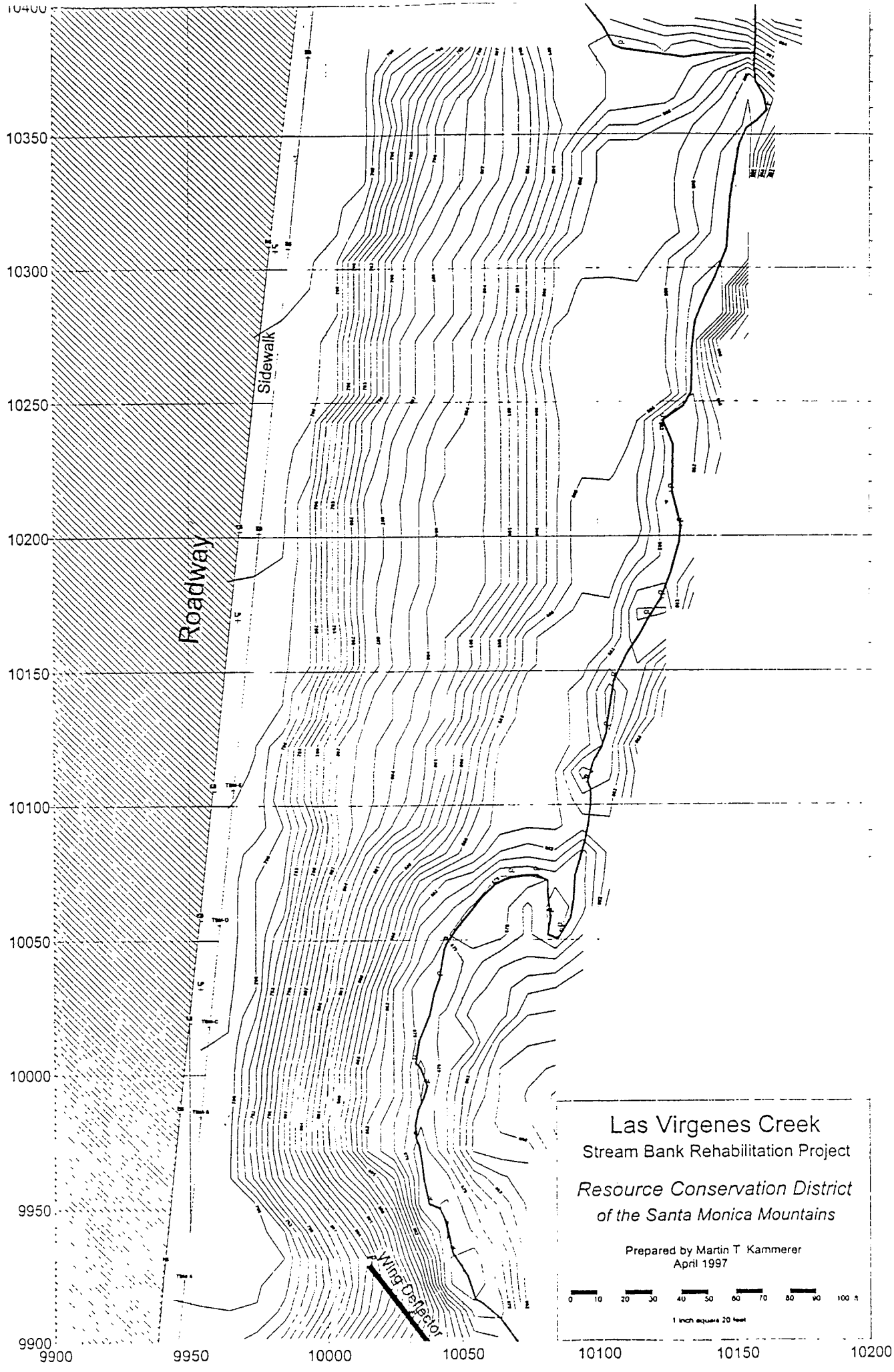
6. Appendix A: HEC-RAS Output (Before Changes)

Lost Hills Before Changes Plan: 15,900 cfs before
Riv Sta = 801 to 108 PF#: 1




Lost Hills Before Changes Plan: 15,900 cfs before
Las Virgenes
EG 1
WS 1
Critical 1
Invert
710
705
700
695
690
685
680
675
670
Elevation (ft)
section 7
section 6
Section 5b
section 5a
section 4
section 3
section 2
section 1
0
200
400
600
800
1000
1200
Main Channel Distance (ft)


Roadway
Sidewalk
Wing Deflector
10350
10300
10250
10200
10150
10100
10050
10000
9950
9900
9900
9950
10000
10050
10100
10150
10200
Las Virgenes Creek
Stream Bank Rehabilitation Project
Resource Conservation District
of the Santa Monica Mountains
Prepared by Martin T Kammerer
April 1997
0 10 20 30 40 50 60 70 80 90 100 ft
1 inch equals 20 feet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10350
10300
10250
10200
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10050
10000
9950
9900
9900
9950
10000
10050
10100
10150
10200
Roadway
Sidewalk
Wing Deflector
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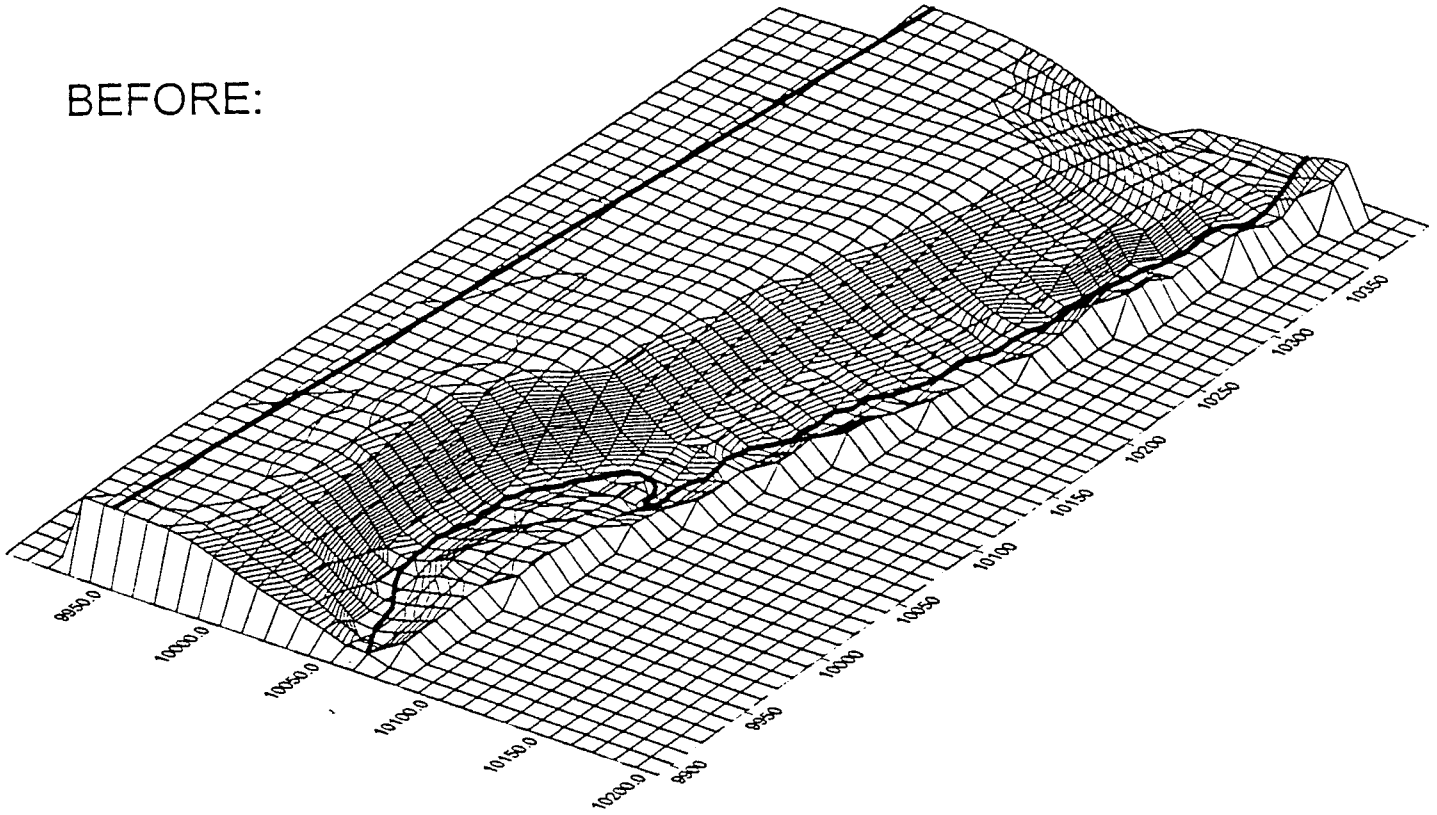
0 10 20 30 40 50 60 70 80 90 100 ft
1 inch square 20 feet

BEFORE:



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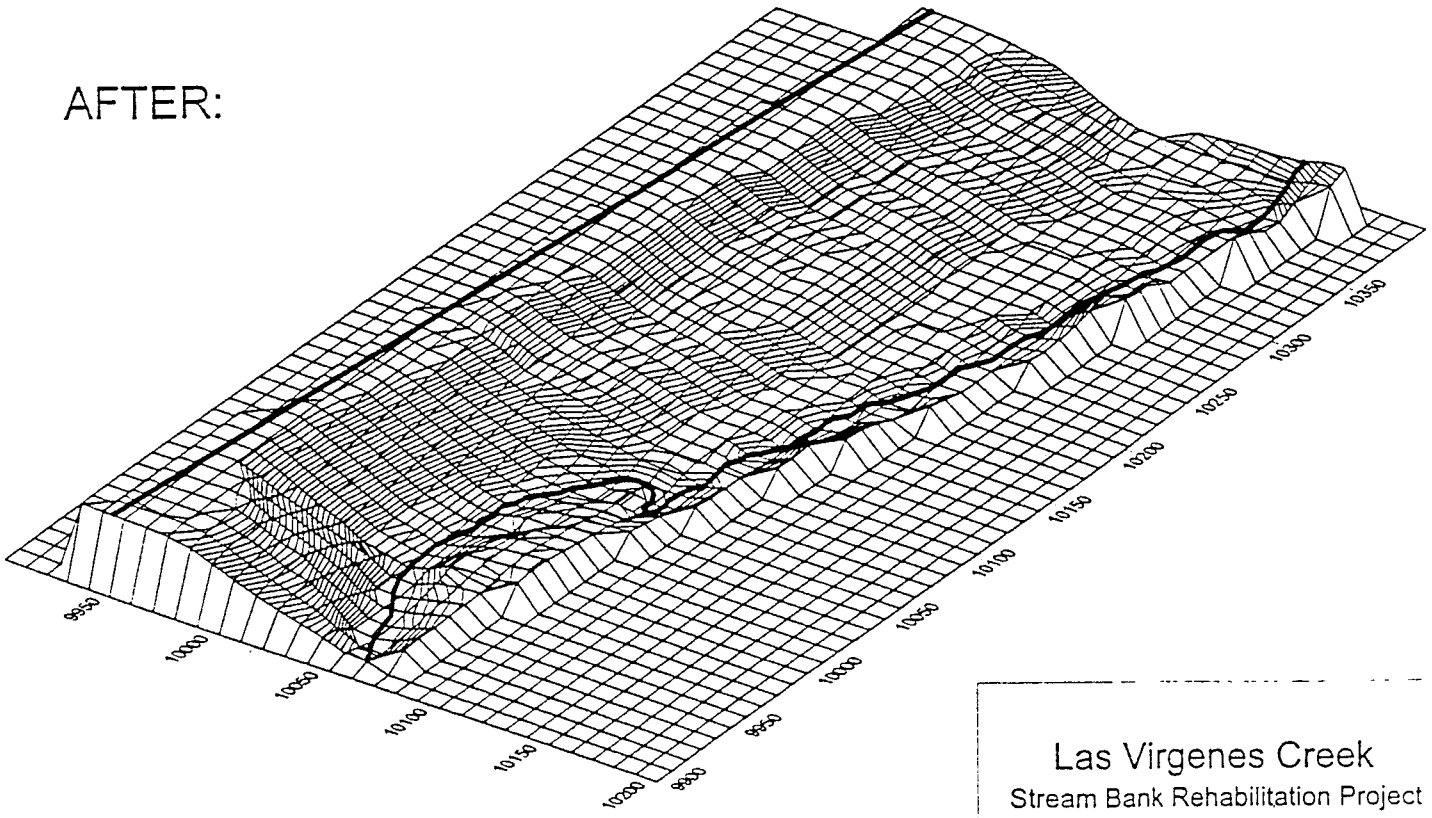

Las Virgenes Creek

Stream Bank Rehabilitation Project

Resource Conservation District
of the Santa Monica Mountains

Prepared by Martin T Kammerer
April 1997

Lost Hills Final Plan: Final 15,900 cfs 4/9/97
Riv Sta = 801 to 108 PF#: 1

Appendix C
The Economy and Ecology of Streambank Trees

Prepared by
Rosi Dagit, Certified Arborist, Conservation Biologist
Resource Conservation District of the Santa Monica Mountains

Western Chapter ISA. 1993. Western Chapter Species Classification and Group Assignment. Western Chapter ISA, Arizona.

ABSTRACT:

Presented by Rosi Dagit, Certified Arborist #1084 to the Second Interface Between Ecology and Development Conference, Occidental College, 18-19 April 1997

The Economy and Ecology of Streambank Trees

There is widespread agreement that trees play a critical role in stabilizing streambanks. In the canyons of Southern California, roads, utility lines and streams frequently share common and competing space within the narrow confines of the mountains. Typically, road improvement/ repair project costs are based solely on construction, ignoring the cost associated with injuring or removing trees and other riparian vegetation which currently hold up the banks for free. Using International Society of Arboriculture Standard Trunk Formula Method for Valuation, an inventory of all trees within 15' of a 3.5 mile stretch of Old Topanga Canyon Road (Los Angeles County, CA) was conducted. The value of 150 trees came to more than $3.7 million. This information has been useful in helping evaluate the real costs of improvement projects and affected subsequent design modifications. It has set the stage for more realistic mitigations and overall watershed planning efforts.

THE ECONOMY AND ECOLOGY OF STREAMBANK TREES

Rosi Dagit, Certified Arborist
Resource Conservation District of the Santa Monica Mountains

Presented to the Second Interface Between Ecology and Development Conference, Occidental College, 18-19 April 1997

PROBLEM:

How are costs of road infrastructure projects effected when preservation of riparian trees and habitat are made a priority?

BACKGROUND:

In geologically young streams such as Topanga Creek, bank stability is directly related to soil type, slope and streambank (riparian) vegetation. In the Topanga Canyon Significant Watershed, the stream, utility lines, and roads share common and often competing space within the narrow, steep sided gorges of the mountains.

Trees provide essential stability. The leaves and branches moderate stream temperature, dissipate rainfall, reduce stormwater run-off by encouraging infiltration, and physically reduce flow velocity. The roots hold the soil, preventing erosion. Removal of trees either by design or by fire results in more damaging stormwater flows (Keene 1997).

Since 1991, proposed and completed infrastructure projects along Old Topanga Canyon Rd. have occured. Some projects were installed under emergency conditions following natural disasters. Those proposed since 1995 have undergone substantial re-design in response to community concerns and the development of the Topanga Creek Watershed Management Study.

Each time a new culvert or hardscape is installed along Topanga Creek, the flow dynamics downstream are altered. Channel modifications can cause more problems downstream unless viewed within the context of the whole creek. Solutions proposed by LA County Dept. of Public Works (DPW) rely on concrete walls, large box culverts and grouted rock rip rap walls. In the past, installation of these structures has permanently removed most vegetation along the bank.

By contrast, many residential attempts at bank stabilization have relied upon variations of flood control fencing and gabion construction (wire mesh baskets filled with rocks), which encourage plant establishment and limit erosion effects downstream.

The Los Angeles County Foresters provide specific guidelines for construction within the protected zones of trees (5 feet outside the dripline, or at least 15 feet from the trunk). Coast Live Oaks (Quercus agrifolia) are protected by a LA County ordinance which requires that all work within the protected zone be done with hand tools under arborist supervision, to ensure that roots are protected. DPW is technically exempt from this ordinance and in the past has rarely complied with tree preservation requirements.

DPW also needs permits from the Coastal Commission and the California Dept. of Fish and Game. These permits demand compliance with tree preservation standards, and protection of endangered species habitat (Western Pond Turtle, Clemmys marmorata). Mitigations creating better habitat, replanting lost riparian vegetation and biological monitoring are also required.

METHOD:

All trees located within 15' of Old Topanga Canyon Rd. for 3.5 miles were inventoried noting location, species, size and condition. The ISA value was determined according to the 8th Edition of the Guide for Plant Appraisal. The values vary depending on the species classification and group assignment. The difference in square inch price is based upon the difficulty of growing a tree of that species to a comparable size in our particular climate zone.

Group 1	Coast Live Oaks (Q. agrifolia)	$91.00/square inch
Group 2	Sycamores (Platanus racemosa) Walnuts (Juglans californica)	$56.50/square inch
Group 3	no species found	$37.00/square inch
Group 4	Willows (Salix sp.) Eucalyptus sp. Cottonwood (Populus fremontii) Bay (Umbellularia californica)	$27.50/square inch

RESULTS:

Within 15 feet of the road, 150 trees were valued at $3.7 million. The value of the trees within the project construction zones was totaled and compared to the proposed costs of the DPW projects both before and following environmental review (Table 1).

Table 1. Comparison of design costs for proposed projects along Old Topanga Canyon Rd., Topanga (Los Angeles County), CA.

	DPW PROJECTS		
Site Location	**Pre-environmental review**	**Post-environmental review**	**Value of trees in construction zone**
Culvert 3.24 provides natural detention basin	$140,000	no longer deemed necessary	$101,900
Culvert 3.35 Western Pond Turtle habitat	$200,000	still in planning stage	$116,800
Culvert 3.41 Western Pond Turtle habitat	$120,000	$80,000	$73,400
Culvert 3.45 Western Pond Turtle habitat	$130,000	$23,000	$265,400
Culvert 4.96	$200,000	$200,000 completed w/out review	$320,300
Bank near House #940	$50,000	$22,000	$58,800
Bank near House #919	$150,000	$50,000	$103,800
Bank near House #790	$50,000	$40,000	$69,800
Totals	**$1,040,000**	**$415,000**	**$1,110,200**

SUMMARY:

The value of the 150 trees located within 15 feet of Old Topanga Canyon Rd. totals over $3.7 million. This estimate represents a conservative view based solely on the International Society of Arboriculture Guide for Plant Appraisal. The formula incorporates species, size and condition of the trees.

In each case, proposed projects cost significantly less when the designs worked with existing trees and habitat. It is also clear that the value of the trees alone is as much, if not more, than the cost of the projects. Total project cost analysis

should include the value of the trees within the construction zone. The trees provide invaluable slope stabilization while creating an aesthetically pleasing environment critical to the continued survival of numerous dependent species.

It is well documented (Ebenreck 1989) that trees provide hidden economic benefits which are difficult to quantify:

- temperature modification (air and water) resulting in energy savings

- sequester carbon generated by air pollution

- stabilize slopes

- reduce erosion and sedimentation

- reduce storm water run-off volume and velocity

- encourage groundwater recharge

- preserve aquatic and riparian biodiversity

- provide aesthetic value.

A major goal of the Topanga Creek Watershed Management Study is to preserve streambank trees while maintaining road stability. It is clear that retaining the trees results in more cost-effective designs that preserve important ecological areas. Using a cooperative approach to the design process, stakeholders were able to voice important concerns and work together towards solutions. This is a first step towards a comprehensive watershed management plan.

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