

This cost estimate is based on several assumptions:

- These types of projects are extremely variable in their costs, depending on biological, political, and logistical issues encountered. Included costs are estimated at the high end of range when there is question. Each project could potentially be completed at 30% less than the estimate provided in this study.
- Economy of scale is an important factor in controlling costs. Projects can be grouped in a variety of ways that may be different than those used in this study.
- Costs on each sheet in this workbook assume that each project will be built separately. The sheet titled "Grouping" provides recommendations on how to combine projects, and calculates the savings realized through the grouping.
- The scope of work for this task did not include searching for additional projects or issues outside of the immediate areas indicated on our site maps. There may be additional work not captured in these cost-estimates.
- This study assumes that all projects with permits will need 5 years of maintenance and monitoring to meet success criteria, and that all projects will be targeting mitigation-quality results.
- Estimates do not include costs associated with endangered species consultation or associated mitigation measures. Project proponent should take all possible measures to avoid ESA impacts.
- Any impacts incurred to wetland habitats during implementation will be self-mitigated within the proposed project through replacement and expansion of same or similar habitats. The purpose of each project is inherently intended to improve quality and function of natural habitats and systems.

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 7 & 8 (LVC07 and LVC08)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 2,000.00	LS	1	\$ 2,000.00
Field Equipment	\$ 110.00	day	2	\$ 220.00
Topographic Survey	\$ 450.00	acre	2	\$ 900.00
Base Plan Preparation	\$ 650.00	LS	1	\$ 650.00
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 3,000.00	LS	1	\$ 3,000.00
Planting Plan	\$ 1,600.00	acre	0.75	\$ 1,200.00
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS	1	\$ 400.00
Specifications	\$ 2,000.00	LS	1	\$ 2,000.00
Client review and coordination	\$ 800.00	year	2	\$ 1,600.00
ACOE Nationwide permit	\$ 6,000.00	LS	1	\$ 6,000.00
Water Quality Certification	\$ 3,000.00	LS	1	\$ 3,000.00
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 28,970.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 6,000.00	LS	1	\$ 6,000.00
Large Tree removal	\$ 650.00	each	15	\$ 9,750.00
Clearing and Grubbing	\$ 2,330.00	acre	0.75	\$ 1,747.50
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day	8	\$ 3,200.00
Earthwork (balanced)	\$ 20.00	cyd	3700	\$ 74,000.00
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd	3700	\$ 59,200.00
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	1	\$ 1,500.00
Seeding: Hydroseeding	\$ 0.10	S.F.	0.75	\$ 0.08
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.		\$ -
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	400	\$ 2,800.00
Cuttings Installation	\$ 1.00	each	400	\$ 400.00
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 3,000.00	LS	1	\$ 3,000.00
Construction Monitoring	\$ 3,100.00	week	3	\$ 9,300.00
Construction Total				\$ 171,497.58
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 3,000.00	acre/year	3.75	\$ 11,250.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 3,500.00	year	5	\$ 17,500.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 32,750.00
Project Total				\$ 233,217.58

Project Description

The master plan's intentions for LVC07 and LVC08 are difficult to identify and distinguish in the field. Our study will treat them as one project. The entire area is roughly .75 acres along 500 l.f. of the creek. The creek is concrete-lined as it emerges from beneath Las Virgenes Rd. There is ample room between the channel and the onramp to recontour and recreate a riparian corridor. The area currently is heavily used by transients.

Recommendations

1. Recontour roughly 250 l.f. of banks starting at the end of the concrete section. Widen floodplain to 150-200'.
2. Salvage existing native riparian plant material prior to grading.
3. Protect all existing plant material outside the grading limit.
4. Remove existing eucalyptus and non-native species in the reach. (~ 15 trees)
5. Plant and seed the area heavily with riparian forest species.
6. Actively maintain and monitor the project for 3-5 years.

Assumptions

1. Construction drawings and specifications will be necessary.
2. Caltrans approval will require substantial coordination effort.
3. Supplemental watering will not be necessary
4. Earthwork can be balanced on-site

Project Benefits

Water Quality	High
Habitat Improvement	Moderate
Flood conveyance	Moderate
Groundwater recharge	Moderate
Aesthetics	Moderate
Public Safety	Moderate
Permitting Difficulty	High

Site Map and Photos

[Graphics & Figures\Site Locations\LVC-07.08.pdf](#)
[Photos\LVC07andLVC08\LVC07FloodplainE2W.JPG](#)
[Photos\LVC07andLVC08\LVC07NorthEndN2S.JPG](#)

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 13 (LVC13)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 1,000.00	LS	1	\$ 1,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre		\$ -
Base Plan Preparation	\$ 650.00	LS		\$ -
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 2,500.00	LS		\$ -
Planting Plan	\$ 1,600.00	acre		\$ -
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS		\$ -
Specifications	\$ 2,000.00	LS		\$ -
Client review and coordination	\$ 800.00	year	1	\$ 800.00
ACOE Nationwide permit	\$ 6,000.00	LS		\$ -
Water Quality Certification	\$ 3,000.00	LS		\$ -
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 9,910.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 2,000.00	LS	1	\$ 2,000.00
Large Tree removal	\$ 650.00	each		\$ -
Clearing and Grubbing	\$ 2,330.00	acre		\$ -
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre	0.05	\$ 750.00
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd		\$ -
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	0.5	\$ 750.00
Seeding: Hydroseeding	\$ 0.10	S.F.		\$ -
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.	4356	\$ 871.20
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	50	\$ 350.00
Cuttings Installation	\$ 1.00	each	50	\$ 50.00
Bioengineering Practices	\$ 30.00	LF	50	\$ 1,500.00
Erosion Control Installation	\$ 3,000.00	LS		\$ -
Construction Monitoring	\$ 3,100.00	week		\$ -
Construction Total				\$ 6,871.20
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 3,000.00	acre/year	2.5	\$ 7,500.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 2,500.00	year	5	\$ 12,500.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 24,000.00
Project Total				\$ 40,781.20

Project Description
LVC13 begins roughly 125' downstream from the Agroura Rd bridge, and ends roughly 200' further downstream, covering approximately .5 acre. The east bank is high quality riparian forest and is relatively undisturbed. The west bank has been filled to some degree. The top portion of the banks is dominated by Pepper Trees, and the lower banks support large mature riparian forest species such as Salix, Juglans, and Quercus. Given the high financial cost AND the high environmental cost of recontouring the west bank, we recommend against the bank recontouring recommended in the master plan unless/until other factors disturb the area or provide greater incentive to widen the floodplain. Alternate recommendations follow.

Recommendations
Treat this area as an enhancement project, preserving all existing native material. Enhancement plantings should be installed at the toe of the slope, and in bare areas on the banks. Minor hand grading may be beneficial in some areas. The Pepper Trees at the top of slope are included in the description for LVC16.
<ol style="list-style-type: none"> 1. Protect all existing native trees in place. 2. Selectively place rocks, logs, and plantings at the toe of the slope. (bioengineering) 3. Fill in plantings within the remainder of the area. 4. Selectively kill sparse non-native species.

Assumptions
<ol style="list-style-type: none"> 1. There are currently no major hydrological reasons to pursue major earthwork. 2. Construction documents will not be necessary. 3. Construction monitoring will be done by crew foreman and is not an added cost.

Project Benefits	
Water Quality	low
Habitat Improvement	low
Flood conveyance	-
Groundwater recharge	-
Aesthetics	-
Public Safety	-
Permitting Difficulty	moderate

Site Map and Photos
Graphics & Figures\Site Locations\LVC-13,14,16.pdf Photos\LVC13\LVC13N2S.JPG

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 14 (LVC14)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 2,000.00	LS	1	\$ 2,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre		\$ -
Base Plan Preparation	\$ 650.00	LS		\$ -
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 2,500.00	LS		\$ -
Planting Plan	\$ 1,600.00	acre		\$ -
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS		\$ -
Specifications	\$ 2,000.00	LS		\$ -
Client review and coordination	\$ 800.00	year	1	\$ 800.00
ACOE Nationwide permit	\$ 6,000.00	LS	1	\$ 6,000.00
Water Quality Certification	\$ 3,000.00	LS	1	\$ 3,000.00
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 19,910.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 4,000.00	LS	1	\$ 4,000.00
Large Tree removal	\$ 650.00	each		\$ -
Clearing and Grubbing	\$ 2,330.00	acre		\$ -
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd		\$ -
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
In-stream structures (boulders, logs, etc)	\$ 500.00	each	16	\$ 8,000.00
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	1	\$ 1,500.00
Seeding: Hydroseeding	\$ 0.10	S.F.		\$ -
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.	2178	\$ 435.60
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	32	\$ 224.00
Cuttings Installation	\$ 1.00	each	80	\$ 80.00
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 3,000.00	LS		\$ -
Construction Monitoring	\$ 3,100.00	week	1	\$ 3,100.00
Construction Total				\$ 17,939.60
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 3,000.00	acre/year	0.6	\$ 1,800.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 1,000.00	year	3	\$ 3,000.00
Reporting	\$ 800.00	year	3	\$ 2,400.00
M&M Total				\$ 7,200.00
Project Total				\$ 45,049.60

Project Description

We were unable to discern an exact extent of this site as described in the master plan., which calls for an increase in stream gradient to avoid standing water. There is slow/standing water in this reach, but there is no feasible opportunity to increase gradients. The channel is already very straight and there are no major grade breaks downstream where the project could reconnect with existing grade. Increasing the gradient in this section would simply create a bigger standing pool of water.

Standing water is still an issue, and we do recommend alternative means to increase velocities, as described below. Our suggested project extends along 160' of Las Virgenes Creek.

Recommendations

To increase velocity, we recommend narrowing the effective flow area of the channel through strategic alternating placement of boulders, logs, and/or plantings. Since $Q=V \cdot A$, and Q is constant in any given snapshot, then decreasing A will increase V and minimize standing

1. Protect all existing native plant material.
2. Place rocks, logs, and/or plantings in an alternating fashion to reduce effective flow area.
3. Reseed and replant any areas damaged or disturbed during installation.
4. Actively monitor the site to determine effectiveness of the treatment for 3 years.

Assumptions

1. No construction drawings will be necessary.
2. No supplemental watering will be necessary.

Project Benefits

Water Quality	moderate
Habitat Improvement	low
Flood conveyance	-
Groundwater recharge	-
Aesthetics	-
Public Safety	moderate
Permitting Difficulty	moderate

Site Map and Photos

[Graphics & Figures\Site Locations\LVC-13,14,16.pdf](#)
[Photos\LVC14\LVC14StandingWaterN2S.JPG](#)

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 16 (LVC16)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 2,000.00	LS	1	\$ 2,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre		\$ -
Base Plan Preparation	\$ 650.00	LS	1	\$ 650.00
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 2,500.00	LS	1	\$ 2,500.00
Planting Plan	\$ 1,600.00	acre	1	\$ 1,600.00
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS	1	\$ 400.00
Specifications	\$ 2,000.00	LS	1	\$ 2,000.00
Client review and coordination	\$ 800.00	year	1	\$ 800.00
ACOE Nationwide permit	\$ 6,000.00	LS		\$ -
Water Quality Certification	\$ 3,000.00	LS		\$ -
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 18,060.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 6,000.00	LS	1	\$ 6,000.00
Large Tree removal	\$ 300.00	each	200	\$ 60,000.00
Clearing and Grubbing	\$ 2,330.00	acre		\$ -
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd	500	\$ 10,000.00
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd	500	\$ 8,000.00
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	1	\$ 1,500.00
Seeding: Hydroseeding	\$ 0.10	S.F.	60000	\$ 6,000.00
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.		\$ -
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	700	\$ 4,900.00
Cuttings Installation	\$ 1.00	each	150	\$ 150.00
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 3,000.00	LS	1	\$ 3,000.00
Construction Monitoring	\$ 3,100.00	week	2	\$ 6,200.00
Construction Total				\$ 106,350.00
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 3,000.00	acre/year	5	\$ 15,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 3,500.00	year	5	\$ 17,500.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 36,500.00
Project Total				\$ 160,910.00

Project Description
LVC16 includes an area of roughly .15 acre that is in need of bank recontouring (as noted in the master plan), plus an additional area of roughly .7 acre dominated by Pepper Trees (not identified in the master plan). The Pepper Trees form a continuous line roughly 20' wide along the entire length of the parking lot to the west of the creek corridor, from Agoura Road to the condo complex to the south. The trees are apparently part of the landscape design of the business complex, so a suggested replacement design should be responsive to the aesthetic and functional needs of the property. The design also includes a few Sycamores, which could be used as a replacement species. The bank recontouring is in an area that has been filled, with steep sideslopes and a concrete foundation(?) at its toe. It stands out in stark topographic contrast to its immediate surroundings. Heavy equipment access is excellent from the adjacent parking lot.

Recommendations
Remove the entire line of Pepper Trees and replace with native species that can double as attractive landscape plants. Recontour the banks of the fill area and revegetate the area with native riparian forest.
1. Remove existing exotic trees.
2. Recontour banks
3. Install native plantings
4. Actively maintain and monitor for 3-5 years.

Assumptions
1. Construction documents will be necessary
2. Supplemental watering will not be necessary
3. Earthwork cannot be balanced on-site.

Project Benefits	
Water Quality	low
Habitat Improvement	high
Flood conveyance	low
Groundwater recharge	low
Aesthetics	-
Public Safety	-
Permitting Difficulty	low

Site Map and Photos
Graphics & Figures\Site Locations\LVC-13,14,16.pdf
Photos\LVC16\LVC16ConcreteNend.JPG
Photos\LVC16\LVC16EarthworkToeS2N.JPG
Photos\LVC16\LVC16SchinusS2N.JPG

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 18 (LVC18)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 2,000.00	LS	1	\$ 2,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre	2	\$ 900.00
Base Plan Preparation	\$ 650.00	LS	1	\$ 650.00
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each	3	\$ 1,950.00
Grading Plan	\$ 2,500.00	LS	1	\$ 2,500.00
Planting Plan	\$ 1,600.00	acre	0.5	\$ 800.00
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS	1	\$ 400.00
Specifications	\$ 2,000.00	LS	1	\$ 2,000.00
Client coordination public outreach	\$ 2,000.00	year	1	\$ 2,000.00
ACOE Nationwide permit	\$ 6,000.00	LS	1	\$ 6,000.00
Water Quality Certification	\$ 3,000.00	LS	1	\$ 3,000.00
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 30,310.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 6,000.00	LS	1	\$ 6,000.00
Large Tree removal	\$ 650.00	each	12	\$ 7,800.00
Clearing and Grubbing	\$ 2,330.00	acre	0.18	\$ 419.40
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd	2000	\$ 40,000.00
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd	2000	\$ 32,000.00
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	0.18	\$ 270.00
Seeding: Hydroseeding	\$ 0.10	S.F.	7840.8	\$ 784.08
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.		\$ -
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each	20	\$ 1,000.00
Potted Plantings (1 gal)	\$ 7.00	each	150	\$ 1,050.00
Cuttings Installation	\$ 1.00	each	150	\$ 150.00
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 3,000.00	LS	1	\$ 3,000.00
Construction Monitoring	\$ 3,100.00	week	3	\$ 9,300.00
Construction Total				\$ 102,373.48
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 10,000.00	LS	1	\$ 10,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 2,500.00	year	5	\$ 12,500.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 26,500.00
Project Total				\$ 159,183.48

Project Description

LVC18 is roughly .18 acres in size along 200 L.F. of Las Virgenes Creek's east bank. The bank ranges from steeper than 1:1 to beyond vertical in this reach, and tops out to what appears to be a fill bench between the creek and the homes fronting it. The bank is 15-25' tall and is heavily vegetated with native riparian forest species. Many of the larger trees are stemming from near the bottom of the bank, so there is room for earthwork above them. There is approximately 60' between the bank and the back fences of homes. The bench is primarily non-native grassy species and is used by adjacent home-owners as an extension of back yards and a nature-exploration area. We spoke with one resident who was interested in the project; she indicated the residents would be slightly skeptical of it. A sewer line apparently also runs along the creek through this bench.

Recommendations

Lay back the banks to a maximum grade of 1:1, preferably 2:1. Leave a portion of the bench, and be careful for the sewer lines. Grading in most areas should start just up-slope from the existing large trees. Salvage willows for replanting (other species as feasible).

1. Protect existing large trees to the extent feasible.
2. Salvage native species
3. Lay back banks
4. Plant and seed
5. Actively maintain and monitor for 3-5 years.

Assumptions

1. Construction drawings will be necessary.
2. Supplemental watering will not be necessary.
3. Equipment access is possible from the south

Project Benefits

Water Quality	moderate
Habitat Improvement	moderate
Flood conveyance	moderate
Groundwater recharge	moderate
Aesthetics	moderate
Public Safety	high
Permitting Difficulty	moderate

Site Map and Photos

[Graphics & Figures\Site Locations\LVC-18,19,20.pdf](#)
[Photos\LVC18\LVC18SendS2N.JPG](#)
[Photos\LVC18\LVC18SewerS2N.JPG](#)
[Photos\LVC18\LVC18VerticalBanksS2N.JPG](#)

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 19 (LVC19)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 500.00	LS	1	\$ 500.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre		\$ -
Base Plan Preparation	\$ 650.00	LS		\$ -
Conceptual Restoration Plan (map + narrative)	\$ 1,500.00	LS	1	\$ 1,500.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 2,500.00	LS		\$ -
Planting Plan	\$ 1,600.00	acre		\$ -
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS		\$ -
Specifications	\$ 2,000.00	LS		\$ -
Client review and coordination	\$ 800.00	year	1	\$ 800.00
ACOE Nationwide permit	\$ 6,000.00	LS		\$ -
Water Quality Certification	\$ 3,000.00	LS		\$ -
DFG 1600 agreement	\$ 3,000.00	LS		\$ -
Design Total				\$ 2,910.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS		\$ -
Mobilization / Demobilization	\$ 2,000.00	LS	1	\$ 2,000.00
Large Tree removal	\$ 650.00	each		\$ -
Clearing and Grubbing	\$ 2,330.00	acre	0.05	\$ 116.50
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd		\$ -
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre		\$ -
Seeding: Hydroseeding	\$ 0.10	S.F.		\$ -
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.		\$ -
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	50	\$ 350.00
Cuttings Installation	\$ 1.00	each		\$ -
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 1,000.00	LS	1	\$ 1,000.00
Construction Monitoring	\$ 3,100.00	week	0.5	\$ 1,550.00
Construction Total				\$ 5,016.50
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 3,000.00	LS	1	\$ 3,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 1,500.00	year	2	\$ 3,000.00
Reporting (letter report)	\$ 400.00	year	2	\$ 800.00
M&M Total				\$ 6,800.00
Project Total				\$ 14,726.50

Project Description

LVC19 is a small bare area (~5000 sqft and gully on the west bank of Las Virgenes Creek. It is not a major problem area, but would benefit from trash cleanup and some riparian plantings to stabilize the soil.

Recommendations

Clean up trash and debris in the area. Plant *Bacharis sarothroides*, *Juglans* and *Salix* in the gully and immediate surrounding area. It is unlikely this area would be attractive as a mitigation area, so we recommend a limited maintenance and monitoring program of 2 years.

1. Clean up trash
2. Plant native species
3. Actively maintain and monitor for 2 years.

Assumptions

1. No construction documents are necessary.
2. No supplemental watering will be necessary.

Project Benefits

Water Quality	low
Habitat Improvement	low
Flood conveyance	-
Groundwater recharge	-
Aesthetics	low
Public Safety	low
Permitting Difficulty	low

Site Map and Photos

[Graphics & Figures\Site Locations\LVC-18,19,20.pdf](#)
[Photos\LVC19\LVC19.JPG](#)

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 20 (LVC20)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 2,000.00	LS	1	\$ 2,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre		\$ -
Base Plan Preparation	\$ 650.00	LS		\$ -
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 2,500.00	LS		\$ -
Planting Plan	\$ 1,600.00	acre		\$ -
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS		\$ -
Specifications	\$ 2,000.00	LS		\$ -
Client review and coordination	\$ 800.00	year	1	\$ 800.00
ACOE Nationwide permit	\$ 6,000.00	LS		\$ -
Water Quality Certification	\$ 3,000.00	LS		\$ -
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 10,910.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 6,000.00	LS	1	\$ 6,000.00
Large Tree removal	\$ 650.00	each	60	\$ 39,000.00
Clearing and Grubbing	\$ 2,330.00	acre	0.6	\$ 1,398.00
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd		\$ -
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	0.6	\$ 900.00
Seeding: Hydroseeding	\$ 0.10	S.F.		\$ -
Seeding: Imprinting	\$ 0.05	S.F.	26136	\$ 1,306.80
Seeding: Hand Broadcast	\$ 0.20	S.F.		\$ -
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	400	\$ 2,800.00
Cuttings Installation	\$ 1.00	each		\$ -
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 3,000.00	LS	1	\$ 3,000.00
Construction Monitoring	\$ 3,100.00	week	2	\$ 6,200.00
Construction Total				\$ 61,204.80
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 3,000.00	acre/year	3	\$ 9,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 2,500.00	year	5	\$ 12,500.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 25,500.00
Project Total				\$ 97,614.80

Project Description

LVC20 is a stand of Eucalyptus trees on a .6 acre patch of the east bank of Las Virgenes Creek. There are approximately 60 trees averaging 50' tall and 20-24" dbh. No significant understory exists. The area is primarily a flat bench behind development. Most of the contextual issues notes for LVC18 will also apply to this area.

Recommendations

Remove and kill all Eucalyptus and other exotic species. Expand riparian forest habitat to the top of banks and as far beyond as possible, roughly 15-20 feet.

1. Remove exotics.
2. Plant riparian forest
3. Actively maintain and monitor for 3-5 years.

Assumptions

1. No construction documents are necessary.
2. No supplemental watering will be necessary.
3. Access is possible through a utility easement abutting the project.

Project Benefits

Water Quality	low
Habitat Improvement	high
Flood conveyance	-
Groundwater recharge	-
Aesthetics	-
Public Safety	-
Permitting Difficulty	low

Site Map and Photos

[Graphics & Figures\Site Locations\LVC-18,19,20.pdf](#)
[Photos\LVC20\LVC20EucsN2s.JPG](#)
[Photos\LVC20\LVC20EucsS2n.JPG](#)

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 23 (LVC23)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 1,000.00	LS	1	\$ 1,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre		\$ -
Base Plan Preparation	\$ 650.00	LS		\$ -
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 2,500.00	LS		\$ -
Planting Plan	\$ 1,600.00	acre		\$ -
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS		\$ -
Specifications	\$ 2,000.00	LS		\$ -
Client review and coordination	\$ 800.00	year	1	\$ 800.00
ACOE Nationwide permit	\$ 6,000.00	LS		\$ -
Water Quality Certification	\$ 3,000.00	LS		\$ -
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 9,910.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 2,000.00	LS	1	\$ 2,000.00
Large Tree removal	\$ 650.00	each		\$ -
Clearing and Grubbing	\$ 2,330.00	acre	0.15	\$ 349.50
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd		\$ -
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	0.15	\$ 225.00
Seeding: Hydroseeding	\$ 0.10	S.F.		\$ -
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.	6534	\$ 1,306.80
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	100	\$ 700.00
Cuttings Installation	\$ 1.00	each	100	\$ 100.00
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 3,000.00	LS		\$ -
Construction Monitoring	\$ 3,100.00	week	1	\$ 3,100.00
Construction Total				\$ 8,381.30
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 10,000.00	LS	1	\$ 10,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 2,000.00	year	5	\$ 10,000.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 24,000.00
Project Total				\$ 42,291.30

Project Description

LVC23 is a .15 acre area on the west side of Las Virgenes Creek, near Lost Hills Road. It occupies a flat area between the bottom of the adjacent fill slope and the existing edge of riparian vegetation. The area is currently mowed and kept clear of tall vegetation. Provided there are no conflicting issues with neighboring properties, it will be a relatively easy project to implement.

Recommendations

Plant riparian woodland and riparian forest species to match the adjacent habitat.

Assumptions

1. Construction documents are not necessary.
2. Supplemental watering is not necessary.
3. Access is available from Lost Hills Rd.

Project Benefits

Water Quality	low
Habitat Improvement	low
Flood conveyance	-
Groundwater recharge	low
Aesthetics	low
Public Safety	-
Permitting Difficulty	low

Site Map and Photos

[Graphics & Figures\Site Locations\LVC-23,24.pdf](#)
[Photos\LVC23\LVC23N2S.JPG](#)
[Photos\LVC23\LVC23Overhead.JPG](#)
[Photos\LVC23\LVC23S2N.JPG](#)

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 24 (LVC24)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 2,000.00	LS	1	\$ 2,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre	2	\$ 900.00
Base Plan Preparation	\$ 650.00	LS	1	\$ 650.00
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each	1	\$ 650.00
Grading Plan	\$ 2,500.00	LS	1	\$ 2,500.00
Planting Plan	\$ 1,600.00	acre	0.4	\$ 640.00
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS	1	\$ 400.00
Specifications	\$ 2,000.00	LS	1	\$ 2,000.00
Client coordination and public outreach	\$ 2,000.00	year	1	\$ 2,000.00
ACOE Nationwide permit	\$ 6,000.00	LS	1	\$ 6,000.00
Water Quality Certification	\$ 3,000.00	LS	1	\$ 3,000.00
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 28,850.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 6,000.00	LS	1	\$ 6,000.00
Large Tree removal	\$ 650.00	each	5	\$ 3,250.00
Clearing and Grubbing	\$ 2,330.00	acre	0.4	\$ 932.00
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd	4500	\$ 90,000.00
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd	4500	\$ 72,000.00
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	0.4	\$ 600.00
Seeding: Hydroseeding	\$ 0.10	S.F.	17424	\$ 1,742.40
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.		\$ -
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	250	\$ 1,750.00
Cuttings Installation	\$ 1.00	each	250	\$ 250.00
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 3,000.00	LS	1	\$ 3,000.00
Construction Monitoring	\$ 3,100.00	week	3	\$ 9,300.00
Construction Total				\$ 189,424.40
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 15,000.00	LS	1	\$ 15,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 3,500.00	year	5	\$ 17,500.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 36,500.00
Project Total				\$ 254,774.40

Project Description

LVC24 is roughly .4 acres in size along 250 L.F. of the east bank of Las Virgenes Creek. Banks are generally steeper than 1:1 and are near vertical in some locations. They are relatively heavily vegetated with native riparian forest species. A storage yard protrudes from the adjacent school site to within three feet of the bank edge; this is the only apparent built feature within the project footprint, and though we did not conduct a detailed inventory, it is potentially a source of pollutants.

Recommendations

Remove the storage yard completely, lay back banks to a more stable angle, and revegetate the entire reach with riparian forest species.

1. Protect existing habitat outside limits of grading
2. Salvage as much plant material as possible
3. Regrade banks
4. Plant and seed
5. Actively maintain and monitor for 3-5 years.

Assumptions

1. Construction drawings will be necessary.
2. Supplemental watering will not be necessary.
3. Access is possible through the adjacent school property.

Project Benefits

Water Quality	high
Habitat Improvement	low
Flood conveyance	low
Groundwater recharge	low
Aesthetics	low
Public Safety	moderate
Permitting Difficulty	moderate

Site Map and Photos

[Graphics & Figures\Site Locations\LVC-23,24.pdf](#)
[Photos\LVC24\LVC24BankToeS2N.JPG](#)
[Photos\LVC24\LVC24BankTopS2N.JPG](#)

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 25 (LVC25)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 5,000.00	LS	1	\$ 5,000.00
Field Equipment	\$ 110.00	day		\$ -
Topographic Survey	\$ 450.00	acre		\$ -
Base Plan Preparation	\$ 650.00	LS		\$ -
Eradication Plan	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 2,500.00	LS		\$ -
Planting Plan	\$ 1,600.00	acre		\$ -
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS		\$ -
Specifications	\$ 2,000.00	LS		\$ -
Client review and coordination	\$ 800.00	year		\$ -
ACOE Nationwide permit	\$ 6,000.00	LS		\$ -
USFWS Biological Opinion	\$ 5,000.00	LS	1	\$ 5,000.00
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 18,000.00
Construction Costs				
Eradication Program Implementation	\$ 150.00	hr	220	\$ 33,000.00
Mobilization / Demobilization	\$ 6,000.00	LS		\$ -
Large Tree removal	\$ 650.00	each		\$ -
Clearing and Grubbing	\$ 2,330.00	acre		\$ -
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd		\$ -
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre		\$ -
Seeding: Hydroseeding	\$ 0.10	S.F.		\$ -
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.		\$ -
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each		\$ -
Cuttings Installation	\$ 1.00	each		\$ -
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 3,000.00	LS		\$ -
Construction Monitoring	\$ 3,100.00	week		\$ -
Construction Total				\$ 33,000.00
Maintenance & Monitoring Costs				
Invasive Species Eradication maint	\$ 150.00	hr/yr	880	\$ 132,000.00
Standard Maint (trash, weeds, erosion, etc)	\$ 3,000.00	acre/year		\$ -
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 3,500.00	year		\$ -
Reporting	\$ 800.00	year		\$ -
M&M Total				\$ 132,000.00
Project Total				\$ 183,000.00

Project Description
LVC25 is listed in the master plan as eradication of <i>Procambarus clarkii</i> , which is a non-native crayfish that can prey on arroyo toad tadpoles. We did not directly observe the species during our field work, and could not in the time allotted conduct a more thorough investigation to determine its presence and extent. This cost estimate is based on virtually no site-specific factual information and should be used accordingly.

Recommendations
Any efforts to eradicate this species that are not done throughout the entire watershed will be wasted effort, because the species is highly mobile. This project should be addressed as a multi-year watershed-level eradication. A Biological Opinion from the USFWS will be necessary prior to the project, and at least one senior-level biologist will need to participate in the field work. A biological team should walk the entire length of the creek each year, catching and killing crayfish seen in all pools along the way. The project should be in-place for a minimum of 5 years.

Assumptions

Project Benefits	
Water Quality	-
Habitat Improvement	high
Flood conveyance	-
Groundwater recharge	-
Aesthetics	-
Public Safety	-
Permitting Difficulty	low

Site Map and Photos

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 29 (LVC29)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 1,000.00	LS	1	\$ 1,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre		\$ -
Base Plan Preparation	\$ 650.00	LS		\$ -
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 2,500.00	LS		\$ -
Planting Plan	\$ 1,600.00	acre		\$ -
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS		\$ -
Specifications	\$ 2,000.00	LS		\$ -
Client review and coordination	\$ 800.00	year	1	\$ 800.00
ACOE Nationwide permit	\$ 6,000.00	LS		\$ -
Water Quality Certification	\$ 3,000.00	LS		\$ -
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 9,910.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 3,000.00	LS	1	\$ 3,000.00
Large Tree removal	\$ 650.00	each		\$ -
Clearing and Grubbing	\$ 2,330.00	acre	0.12	\$ 279.60
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre	0.12	\$ 1,800.00
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd		\$ -
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	0.12	\$ 180.00
Seeding: Hydroseeding	\$ 0.10	S.F.		\$ -
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.	5227.2	\$ 1,045.44
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	100	\$ 700.00
Cuttings Installation	\$ 1.00	each	50	\$ 50.00
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 1,000.00	LS	1	\$ 1,000.00
Construction Monitoring	\$ 3,100.00	week	1	\$ 3,100.00
Construction Total				\$ 11,755.04
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year	0.6	\$ 3,000.00
Standard Maint (trash, weeds, erosion, etc)	\$ 10,000.00	LS	1	\$ 10,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 2,500.00	year	5	\$ 12,500.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 29,500.00
Project Total				\$ 51,165.04

Project Description
LVC29 is an area roughly .12 acres in size on the west bank of Las Virgenes Creek, just north of its intersection with Meadow Creek Lane. The bottom 2/3 of the creek banks in this reach are concrete, and this project lies on the upper 1/3 of the bank, which is dominated by Tamarisk and Fennel. Adjacent habitat is a mixture of riparian woodland and coastal sage habitat types.

Recommendations
Eradicate the Tamarisk, Fennel and other exotic species and replace it with riparian woodland species. Maintain and monitor the project for 3-5 years.

Assumptions
1. The concrete portions of the banks will remain.
2. Construction documents will not be necessary.
3. Supplemental watering will not be necessary.

Project Benefits	
Water Quality	-
Habitat Improvement	high
Flood conveyance	-
Groundwater recharge	-
Aesthetics	moderate
Public Safety	-
Permitting Difficulty	low

Site Map and Photos
Graphics & Figures\Site Locations\LVC-29.pdf
Photos\LVC29\LVC29N2S.JPG
Photos\LVC29\LVC29S2N.JPG

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 32 (LVC32)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 2,000.00	LS	1	\$ 2,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre		\$ -
Base Plan Preparation	\$ 650.00	LS		\$ -
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 2,500.00	LS		\$ -
Planting Plan	\$ 1,600.00	acre		\$ -
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS		\$ -
Specifications	\$ 2,000.00	LS		\$ -
Client review and coordination	\$ 800.00	year	1	\$ 800.00
ACOE Nationwide permit	\$ 3,000.00	LS	1	\$ 3,000.00
Water Quality Certification	\$ 3,000.00	LS	1	\$ 3,000.00
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 16,910.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 2,000.00	LS	1	\$ 2,000.00
Large Tree removal	\$ 650.00	each		\$ -
Clearing and Grubbing	\$ 2,330.00	acre		\$ -
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd		\$ -
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	0.15	\$ 225.00
Seeding: Hydroseeding	\$ 0.10	S.F.		\$ -
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.		\$ -
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	100	\$ 700.00
Cuttings Installation	\$ 1.00	each	300	\$ 300.00
Bioengineering Practices	\$ 30.00	LF	150	\$ 4,500.00
Erosion Control Installation	\$ 3,000.00	LS	1	\$ 3,000.00
Construction Monitoring	\$ 3,100.00	week	1	\$ 3,100.00
Construction Total				\$ 14,425.00
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 10,000.00	LS	1	\$ 10,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 3,000.00	year	5	\$ 15,000.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 29,000.00
Project Total				\$ 60,335.00

Project Description

With the limited information available in the master plan, LVC32 is very difficult to identify and quantity discreetly. There is an area roughly 150' long on the west bank of the creek that is vertical, with an additional 300' upstream that has, to a lesser degree, steep banks subject to erosion and fall hazards. It is unclear what extent of when was intended here. We have defined the site as a .12 acre area along 150' of the creek on the west bank, and our recommendations are included below.

Recommendations

Large-scale earthwork in this area would be impractical due to access limitations on the west bank, and the relatively low benefit from the project. More economically practical benefit will be realized by reinforcing the toe of the slope through plantings and bioengineering.

1. Salvage/harvest willow cuttings from adjacent area
2. Install willow poles and other bioengineering practices based on detailed site analysis
3. Install potted plantings.
4. Actively maintain and monitor for 3-5 years.

Assumptions

1. Construction documents will not be necessary.
2. Supplemental watering will not be necessary.
3. There is no currently public safety issue on the site.

Project Benefits

Water Quality	low
Habitat Improvement	low
Flood conveyance	-
Groundwater recharge	-
Aesthetics	-
Public Safety	low
Permitting Difficulty	low

Site Map and Photos

[Graphics & Figures\Site Locations\LVC-32.33.pdf](#)
[Photos\LVC32\LVC32BanksN2S.JPG](#)
[Photos\LVC32\LVC32BankToeTypN2S.JPG](#)

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 33 (LVC33)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 4,000.00	LS	1	\$ 4,000.00
Field Equipment	\$ 110.00	day	2	\$ 220.00
Topographic Survey	\$ 450.00	acre	3	\$ 1,350.00
Base Plan Preparation	\$ 650.00	LS	1	\$ 650.00
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each	3	\$ 1,950.00
Grading Plan	\$ 2,500.00	LS	1	\$ 2,500.00
Planting Plan	\$ 1,600.00	acre	0.6	\$ 960.00
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS	1	\$ 400.00
Specifications	\$ 2,000.00	LS	1	\$ 2,000.00
Client coordination and public outreach	\$ 2,000.00	year	1	\$ 2,000.00
ACOE Nationwide permit	\$ 6,000.00	LS	1	\$ 6,000.00
Water Quality Certification	\$ 3,000.00	LS	1	\$ 3,000.00
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 33,030.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 6,000.00	LS	1	\$ 6,000.00
Large Tree removal	\$ 650.00	each	20	\$ 13,000.00
Clearing and Grubbing	\$ 2,330.00	acre	0.6	\$ 1,398.00
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd	10000	\$ 200,000.00
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	0.6	\$ 900.00
Seeding: Hydroseeding	\$ 0.10	S.F.		\$ -
Seeding: Imprinting	\$ 0.05	S.F.	87120	\$ 4,356.00
Seeding: Hand Broadcast	\$ 0.20	S.F.		\$ -
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	400	\$ 2,800.00
Cuttings Installation	\$ 1.00	each	400	\$ 400.00
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 3,000.00	LS	1	\$ 3,000.00
Construction Monitoring	\$ 3,100.00	week	4	\$ 12,400.00
Construction Total				\$ 244,854.00
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 4,000.00	acre/year	3	\$ 12,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 3,500.00	year	5	\$ 17,500.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 33,500.00
Project Total				\$ 311,384.00

Project Description

LVC33 is roughly .6 acres along 450 L.F. of the east bank of Las Virgenes Creek. It is not clearly defined in the master plan. Large portions of lower Las Virgenes Creek have steep and/or eroding banks, so defining a start and end to projects without more extensive study is difficult. This site, as we have defined it, stretches from a wide portion of creek downstream through what could potentially be filled banks to a small side-gully opposite the convergence with a small side-drainage. A sewer manhole is located roughly 100' to the east of the banks, and may seriously restrict options for this project.

Recommendations

Investigate the exact alignment of the sewer infrastructure and the possibilities for relocating it, if necessary. If relocation would be necessary, but not feasible, then this project should not be pursued further. If relocation is not necessary or is feasible, then this project should recontour the banks to create 2:1 or gentler slopes and plant the area with riparian forest species.

1. Investigate and coordinate with the managers of the sewer infrastructure.
2. Protect existing native plant material
3. Salvage plant material that will be affected by grading activity.
4. Recontour banks to a slight inside-bend condition.
5. Plant with riparian forest species.
6. Actively maintain and monitor for 3-5 years.

Assumptions

1. Construction drawings will be necessary.
2. Relocation of the sewer line will not be necessary.
3. No supplemental watering will be necessary.
4. Excess soil can be placed on the upland bench area. Export will cost substantially more.

Project Benefits

Water Quality	low
Habitat Improvement	moderate
Flood conveyance	moderate
Groundwater recharge	low
Aesthetics	low
Public Safety	low
Permitting Difficulty	high

Site Map and Photos

[Graphics & Figures\Site Locations\LVC-32,33.pdf](#)
[Photos\LVC33\LVC33S2N.JPG](#)
[Photos\LVC33\LVC33SewerE2W.JPG](#)
[Photos\LVC33\LVC33SteepBanksNW2SE.JPG](#)

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 36 (LVC36)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 2,000.00	LS	1	\$ 2,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre	1	\$ 450.00
Base Plan Preparation	\$ 650.00	LS	1	\$ 650.00
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 2,500.00	LS	1	\$ 2,500.00
Planting Plan	\$ 1,600.00	acre	0.25	\$ 400.00
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS	1	\$ 400.00
Specifications	\$ 2,000.00	LS	1	\$ 2,000.00
Client review and coordination	\$ 800.00	year	1	\$ 800.00
ACOE Nationwide permit	\$ 6,000.00	LS	1	\$ 6,000.00
Water Quality Certification	\$ 3,000.00	LS	1	\$ 3,000.00
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 26,310.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 6,000.00	LS	1	\$ 6,000.00
Large Tree removal	\$ 650.00	each		\$ -
Clearing and Grubbing	\$ 2,330.00	acre	0.25	\$ 582.50
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day	10	\$ 4,000.00
Earthwork (balanced)	\$ 20.00	cyd	800	\$ 16,000.00
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
Channel bed material and placement	\$ 40.00	LF	250	\$ 10,000.00
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	0.1	\$ 150.00
Seeding: Hydroseeding	\$ 0.10	S.F.	0.25	\$ 0.03
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.		\$ -
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	300	\$ 2,100.00
Cuttings Installation	\$ 1.00	each		\$ -
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 3,000.00	LS	1	\$ 3,000.00
Construction Monitoring	\$ 3,100.00	week	3	\$ 9,300.00
Construction Total				\$ 51,732.53
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 10,000.00	LS	1	\$ 10,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 2,500.00	year	5	\$ 12,500.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 26,500.00
Project Total				\$ 104,542.53

Project Description

LVC36 is an artificial drainage ditch extending from a culvert under Las Virgenes Road to the Creek. It becomes more deeply incised as it approaches the creek, where it is roughly 15' deep. The surrounding habitat along most of its length is grassland, which merges into riparian forest near the drainage. The project area is roughly .25 acres.

Recommendations

Recontour the side drainage to accommodate a 10-year storm or greater and design a cobble and boulder bed that will withstand the erosive forces of a 100-year storm. Plant the banks of the channel with facultative wetland species and upland species that will provide stability. Establish a consistent longitudinal grade along its length to avoid a drop at the end. Two relatively small oak trees will be impacted by grading.

Assumptions

1. construction documents will be necessary.
2. no supplemental watering will be necessary.

Project Benefits

Water Quality
Habitat Improvement
Flood conveyance
Groundwater recharge
Aesthetics
Public Safety
Permitting Difficulty

Site Map and Photos

[Graphics & Figures\Site_Locations\LVC-35,36.pdf](#)
[Photos\LVC36\LVC36.JPG](#)

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 41 (LVC41)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 2,000.00	LS	1	\$ 2,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre	1	\$ 450.00
Base Plan Preparation	\$ 650.00	LS	1	\$ 650.00
Conceptual Restoration Plan (map + narrative)	\$ 5,000.00	LS	1	\$ 5,000.00
Renderings, models or photosimulations	\$ 650.00	each	2	\$ 1,300.00
Grading Plan	\$ 2,500.00	LS	1	\$ 2,500.00
Planting Plan	\$ 1,600.00	acre	0.3	\$ 480.00
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS	1	\$ 400.00
Specifications	\$ 2,000.00	LS	1	\$ 2,000.00
Client review and coordination	\$ 800.00	year	1	\$ 800.00
ACOE Nationwide permit	\$ 6,000.00	LS	1	\$ 6,000.00
Water Quality Certification	\$ 3,000.00	LS	1	\$ 3,000.00
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 27,690.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 6,000.00	LS	1	\$ 6,000.00
Large Tree removal	\$ 650.00	each	1	\$ 650.00
Clearing and Grubbing	\$ 2,330.00	acre	0.3	\$ 699.00
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre		\$ -
Traffic Control	\$ 400.00	day	10	\$ 4,000.00
Earthwork (balanced)	\$ 20.00	cyd	300	\$ 6,000.00
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
In-stream structures (boulders, logs, etc)	\$ 500.00	each	5	\$ 2,500.00
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	0.3	\$ 450.00
Seeding: Hydroseeding	\$ 0.10	S.F.	13068	\$ 1,306.80
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.		\$ -
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	200	\$ 1,400.00
Cuttings Installation	\$ 1.00	each	100	\$ 100.00
Bioengineering Practices	\$ 30.00	LF	60	\$ 1,800.00
Erosion Control Installation	\$ 3,000.00	LS	1	\$ 3,000.00
Construction Monitoring	\$ 3,100.00	week	2	\$ 6,200.00
Construction Total				\$ 34,705.80
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year		\$ -
Standard Maint (trash, weeds, erosion, etc)	\$ 10,000.00	LS	1	\$ 10,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 2,500.00	year	5	\$ 12,500.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 26,500.00
Project Total				\$ 88,895.80

Project Description
LVC41 is roughly .3 acres on the outside of a bend of Las Virgenes Creek. The master plan specifies bank recontouring in this area, but our assessment is that the cross-section is not significantly different from natural conditions for a bend such as this. There is one section of bank that is roughly 15-20' tall and past vertical that could present a safety hazard to any pedestrians that may visit the area, therefore, some minor recontouring in that area is worthwhile. Otherwise, our recommendations focus on protection of the toe of the slope. Access is possible from a road marked "private" that intersects Las Virgenes Rd

Recommendations
Lay back the vertical portion of the slope only and do not disturb the bottom 1/3 of the bank. Protect the bottom 1/3 of the bank from high flow events with dense plantings and bioengineering treatments such as brush mattresses. Actively maintain and monitor the site

Assumptions
1. Construction documents will be necessary.
2. No supplemental watering will be necessary.
3. Adequate willow stock exists in the vicinity to supply bioengineering material needs.
4. Earthwork can be balanced somewhere adjacent to the site.

Project Benefits	
Water Quality	low
Habitat Improvement	low
Flood conveyance	-
Groundwater recharge	-
Aesthetics	-
Public Safety	moderate
Permitting Difficulty	moderate

Site Map and Photos
Graphics & Figures\Site Locations\LVC-41.42.pdf
Photos\LVC41\LVC41BankToe.JPG
Photos\LVC41\LVC41VerticalBanksW2E.JPG
Photos\LVC41\LVC41VincaBanks.JPG

Malibu Creek Subwatershed Cost Estimation

Las Virgenes Creek Site 42 (LVC42)

Standard Rough Order of Magnitude Costs

Bid Item	Unit Cost	Units	Quant	Cost
Design Costs				
Field Investigation/Bio Surveying/Mapping	\$ 2,000.00	LS	1	\$ 2,000.00
Field Equipment	\$ 110.00	day	1	\$ 110.00
Topographic Survey	\$ 450.00	acre		\$ -
Base Plan Preparation	\$ 650.00	LS		\$ -
Conceptual Restoration Plan (map + narrative)	\$ 3,000.00	LS	1	\$ 3,000.00
Renderings, models or photosimulations	\$ 650.00	each		\$ -
Grading Plan	\$ 2,500.00	LS		\$ -
Planting Plan	\$ 1,600.00	acre		\$ -
Irrigation Plan	\$ 3,000.00	acre		\$ -
Erosion Control Plan	\$ 400.00	LS		\$ -
Specifications	\$ 2,000.00	LS		\$ -
Client review and coordination	\$ 800.00	year	1	\$ 800.00
ACOE Nationwide permit	\$ 6,000.00	LS		\$ -
Water Quality Certification	\$ 3,000.00	LS		\$ -
DFG 1600 agreement	\$ 3,000.00	LS	1	\$ 3,000.00
Design Total				\$ 8,910.00
Construction Costs				
Preconstruction Surveys (sensitive species)	\$ 600.00	LS	1	\$ 600.00
Mobilization / Demobilization	\$ 2,000.00	LS	1	\$ 2,000.00
Large Tree removal	\$ 650.00	each		\$ -
Clearing and Grubbing	\$ 2,330.00	acre		\$ -
Invasive Weed Kill (Arundo, Tamarisk, etc.)	\$ 15,000.00	acre	0.3	\$ 4,500.00
Traffic Control	\$ 400.00	day		\$ -
Earthwork (balanced)	\$ 20.00	cyd		\$ -
Earthwork (imported fill)	\$ 33.00	cyd		\$ -
Earthwork (disposal of cut)	\$ 16.00	cyd		\$ -
In-stream structures (boulders, logs, etc)	\$ 500.00	each		\$ -
Site/Plant Protection (flagging/fencing)	\$ 1,500.00	acre	0.3	\$ 450.00
Seeding: Hydroseeding	\$ 0.10	S.F.		\$ -
Seeding: Imprinting	\$ 0.05	S.F.		\$ -
Seeding: Hand Broadcast	\$ 0.20	S.F.	13068	\$ 2,613.60
Plant Salvage & Replant: Tree Spade		each		\$ -
Plant Salvage & Replant: By Hand	\$ 50.00	each		\$ -
Potted Plantings (1 gal)	\$ 7.00	each	150	\$ 1,050.00
Cuttings Installation	\$ 1.00	each	100	\$ 100.00
Bioengineering Practices	\$ 30.00	LF		\$ -
Erosion Control Installation	\$ 1,000.00	LS	1	\$ 1,000.00
Construction Monitoring	\$ 3,100.00	week	1	\$ 3,100.00
Construction Total				\$ 15,413.60
Maintenance & Monitoring Costs				
Invasive Weed Eradication maint	\$ 5,000.00	acre/year	1.5	\$ 7,500.00
Standard Maint (trash, weeds, erosion, etc)	\$ 10,000.00	LS	1	\$ 10,000.00
Hand/truck watering	\$ 800.00	acre/visit		\$ -
LA/Bio monitoring of progress (qual & quan)	\$ 2,500.00	year	5	\$ 12,500.00
Reporting	\$ 800.00	year	5	\$ 4,000.00
M&M Total				\$ 34,000.00
Project Total				\$ 58,323.60

Project Description

LVC42 is roughly .3 acres on the east bank of Las Virgenes Creek and is accessible by a small dirt sideroad off of Las Virgenes Rd. Vinca grows densely throughout the area, but the overstory is relatively high quality riparian woodland.

Recommendations

Eradicate Vinca major and replant with native species as necessary. Maintain and monitor the site for 3-5 years to ensure eradication.

Assumptions

1. The Vinca is limited to the immediate vicinity observed during our reconnaissance.
2. No construction documents are necessary.
3. No supplemental watering is necessary.

Project Benefits

Water Quality	-
Habitat Improvement	high
Flood conveyance	-
Groundwater recharge	-
Aesthetics	-
Public Safety	-
Permitting Difficulty	low

Site Map and Photos

[Graphics & Figures\Site Locations\LVC-41,42.pdf](#)
[Photos\LVC42\LVC42.JPG](#)