



CITY of CALABASAS

APPENDIX No. 1



LAS VIRGENES CREEK FIELD NOTES AND DETAIL COST ESTIMATES





CITY of CALABASAS

Las Virgenes Creek

| Construction Code | Project Codes | Project Description | Assumptions | Study & Design Cost | Construction & Inspection Cost | Total Design & Construction | Projected O & M Costs | Comments | Priority |
|-------------------|---------------------|---|---|---------------------|--------------------------------|-----------------------------|-----------------------|--|-----------------|
| FH-LV01 | LVC07, LVC08 | Project is located to the west of Las Virgenes Rd and north of Hwy 101. Recontour Hwy fill area to widen floodplain to ~150' along 250' of the creek. Remove stand of eucalyptus and other exotic species. Establish riparian woodland habitat. | Project earthwork can be balanced on-site. | \$28,970.00 | \$171,497.56 | \$200,467.56 | \$32,750.00 | The area apparently gets heavy transient use. | Low |
| FH-LV02 | LVC13, LVC14, LVC19 | At LVC13, 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. At LVC14, to increase velocity, we recommend narrowing the effective flow area of the channel through strategic alternating placement of boulders, logs, and/or plantings. Changes in stream grade as recommended in the master plan are not feasible. At LVC19, Clean up trash and debris in the area. Plant Baccharis 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. | Project earthwork can be balanced on-site. | \$21,845.00 | \$25,227.30 | \$46,872.30 | \$30,300.00 | The entire existing riparian corridor in this reach is heavily vegetated with native species and many large mature trees. Grading solutions will come at a high temporary cost to habitat. | Moderate to low |
| FH-LV03 | LVC15 | Remove the entire line of Pepper Trees along parking lot 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. | Access will be possible through the adjacent parking lot. Earthwork cannot be balanced on-site. | \$18,060.00 | \$106,350.00 | \$124,410.00 | \$36,500.00 | | High |
| FH-LV04 | LVC18, LVC20, LVC24 | At LVC18, 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). At LVC20, 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. At LVC24, remove the storage yard and lay back banks to a more stable angle along 250' of creek, and revegetate the entire reach with riparian forest species. | Heavy equipment access exists to all sites without access improvements. | \$43,670.00 | \$344,677.66 | \$388,347.66 | \$69,500.00 | | High |
| FH-LV05 | LVC23, LVC29 | At LVC23, plant riparian forest habitat in the flat area between the toe of upland slopes and the riparian habitat to the east. At LVC29, eradicate the Tamarisk, Fennel and other exotic species and replace it with riparian woodland species. | | \$9,910.00 | \$16,536.34 | \$26,446.34 | \$43,250.00 | This project has an excellent likelihood of success. | Moderate |



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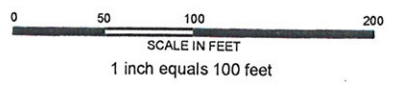
Las Virgenes Creek

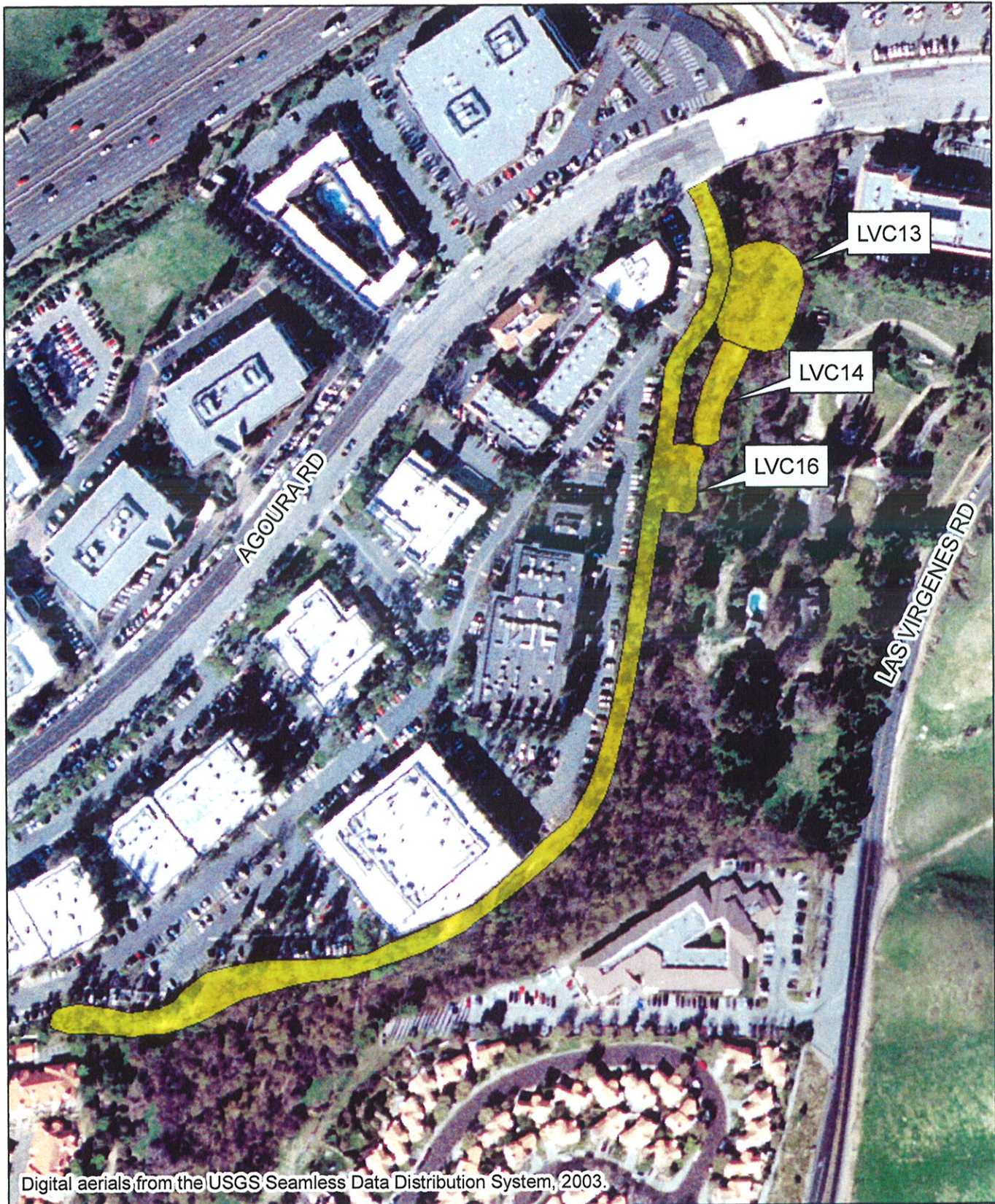
| Construction Code | Project Codes | Project Description | Assumptions | Study & Design Cost | Construction & Inspection Cost | Total Design & Construction | Projected O & M Costs | Comments | Priority |
|-------------------|---------------|--|---|---------------------|--------------------------------|-----------------------------|-----------------------|---|----------|
| FH-LV06 | LVC25 | 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. | Procambarus clarkii is present and represents a threat to valued and/or protected native species. | \$18,000.00 | \$33,000.00 | \$51,000.00 | \$132,000.00 | LVC25 is listed in the master plan as eradication of Procambarus clarkii, 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. | Low |
| FH-LV07 | LVC32, LVC33 | At LVC32, 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 along the 150' project length. At LVC33, 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. | There is no current public safety issue at these sites. | \$33,030.00 | \$253,579.00 | \$286,609.00 | \$47,250.00 | These project sites are similar in nature to much of this reach of Las Virgenes Creek. All of these projects would benefit from further investigation of its historical morphology. | Low |
| FH-LV08 | LVC35, LVC36 | At LVC35, do not recontour the banks; it would impact high quality habitat. Instead, expand riparian forest plantings as far as conditions will allow, roughly .14 acre, and implement a 3-5 year maintenance and monitoring program. At LVC36, 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. | | \$26,310.00 | \$54,578.57 | \$80,888.57 | \$36,250.00 | Two relatively small oak trees will be impacted by grading. | Moderate |
| FH-LV09 | LVC41, LVC42 | At LVC41, 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. At LVC42, eradicate Vinca major and replant with native species as necessary. Maintain and monitor the site for 3-5 years to ensure eradication. | Vinca is limited to the specified project area. | \$28,190.00 | \$55,505.60 | \$84,695.60 | \$48,750.00 | | Moderate |



Digital aerials from the USGS Seamless Data Distribution System, 2003.

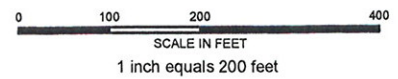
Sites LVC- 07 and LVC- 08





Digital aerials from the USGS Seamless Data Distribution System, 2003.

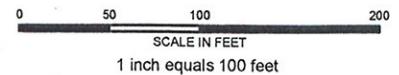
Sites LVC-13, LVC-14 and LVC-16





Digital aerials from the USGS Seamless Data Distribution System, 2003.

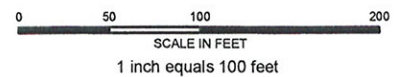
Sites LVC-18, LVC-19 and LVC-20





Digital aerials from the USGS Seamless Data Distribution System, 2003.

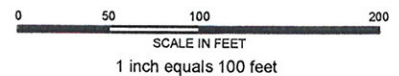
Sites LVC-23 and LVC-24





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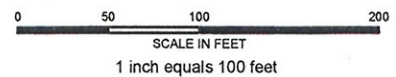
Site LVC-29

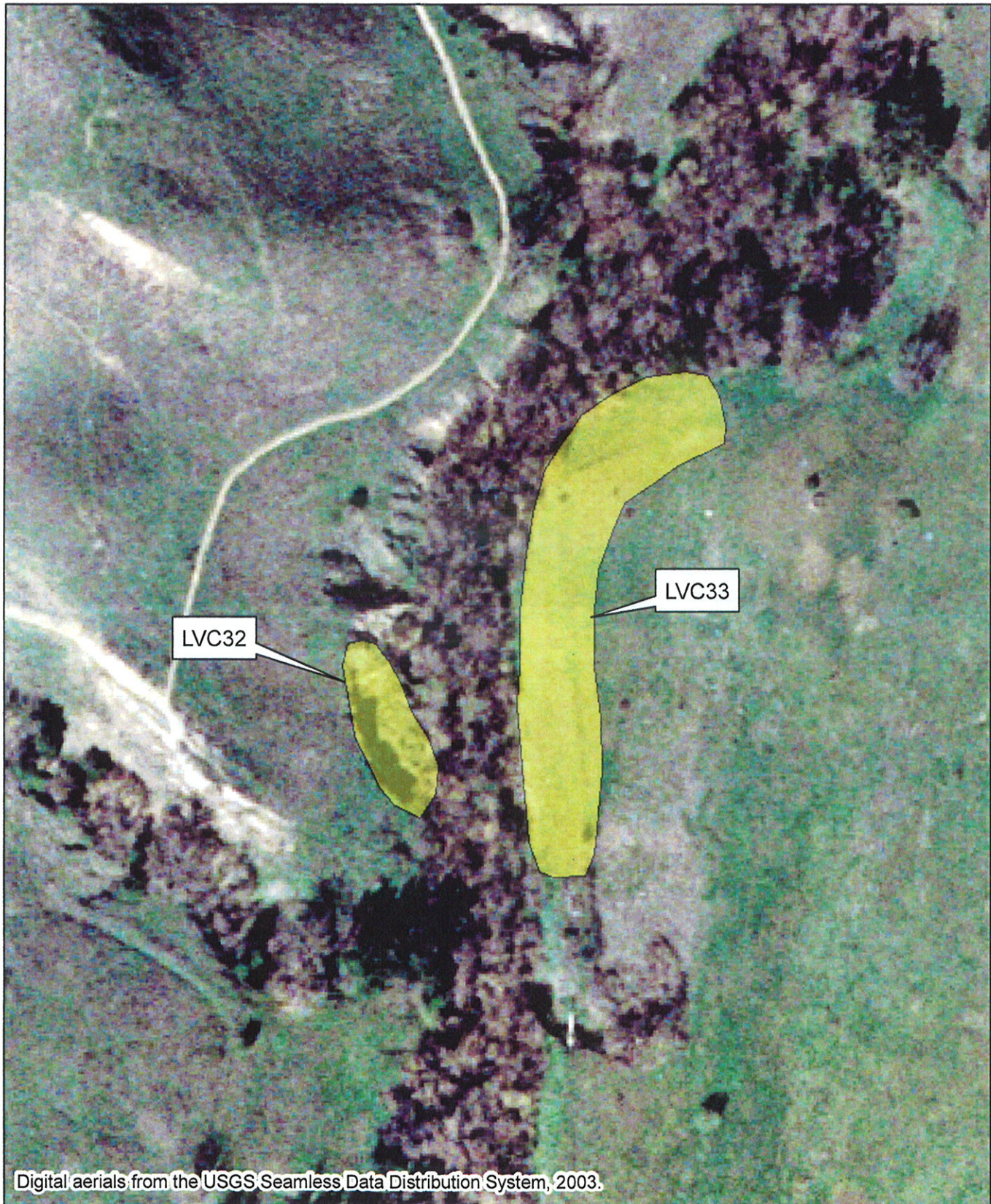




Digital aerials from the USGS Seamless Data Distribution System, 2003.

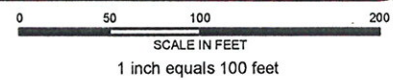
Site LVC-25





Digital aeriels from the USGS Seamless Data Distribution System, 2003.

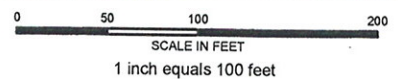
Sites LVC-32 and LVC-33





Digital aerials from the USGS Seamless Data Distribution System, 2003.

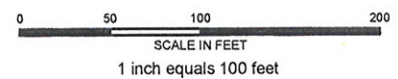
Sites LVC-35 and LVC-36





Digital aeriels from the USGS Seamless Data Distribution System, 2003.

Sites LVC-41 and LVC-42





Overall Cost Estimate Assumption

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 associate 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.



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Standard Rough Order of Magnitude Costs

| Bid Item | Unit Cost | Units | Quant | Cost |
|---|--------------|------------|-------|----------------------|
| Design Costs | | | | |
| Field Investigation/Bo 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 | | | | |
| Reconstruction 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 | | |
| Silt/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 | \$ 50.00 | each | | |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | 400 | \$ 2,800.00 |
| Potted Plantings (1 gal) | \$ 1.00 | each | 400 | \$ 400.00 |
| Cuttings Installation | \$ 30.00 | LF | | |
| Bioengineering Practices | \$ 3,000.00 | LS | 1 | \$ 3,000.00 |
| Erosion Control Installation | \$ 3,100.00 | week | 3 | \$ 9,300.00 |
| Construction Monitoring | | | | |
| 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. Callirans 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

Cost Estimation for LVC-07 and LVC-08



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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 | | | | \$ 6,874.20 |
| 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 | | | | \$ 40,784.20 |

Project Description

LVC13 begins roughly 125' downstream from the Agoura 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.

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

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

Cost Estimation for LVC-13



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Standard Rough Order of Magnitude Costs

| Big 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; Renderings, models or photos/simulations) | \$ 5,000.00 | LS | 1 | \$ 5,000.00 |
| 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 | | | | |
| Reconstruction Surveys (sensitive species) | \$ 500.00 | LS | 1 | \$ 500.00 |
| 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: Hydros seeding | \$ 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 | \$ 50.00 | each | | \$ - |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | 32 | \$ 224.00 |
| Potted Plantings (1 gal) | \$ 1.00 | each | 80 | \$ 80.00 |
| Cuttings Installation | \$ 30.00 | LF | | \$ - |
| Bioengineering Practices | \$ 3,000.00 | LS | | \$ - |
| Erosion Control Installation | \$ 3,100.00 | week | 1 | \$ 3,100.00 |
| 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 |
| Handtruck watering | \$ 800.00 | acre/visit | | \$ - |
| LAV/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*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

Cost Estimation for LVC-14



CITY of CALABASAS

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; Renderings, models or photosimulations) | \$ 5,000.00 | LS | 1 | \$ 5,000.00 |
| Grading Plan | \$ 650.00 | each | 1 | \$ 650.00 |
| Planting Plan | \$ 2,500.00 | LS | 1 | \$ 2,500.00 |
| Irrigation Plan | \$ 1,600.00 | acre | 1 | \$ 1,600.00 |
| 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 | | | | \$ 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 |
| Cleaning and Grubbing | \$ 2,330.00 | acre | 1 | \$ 2,330.00 |
| Invasive Weed Kill (Arundo, Tamarisk, etc.) | \$ 15,000.00 | acre | 1 | \$ 15,000.00 |
| Traffic Control | \$ 400.00 | day | 500 | \$ 200,000.00 |
| Earthwork (balanced) | \$ 20.00 | cyd | 500 | \$ 10,000.00 |
| Earthwork (imported fill) | \$ 33.00 | cyd | 500 | \$ 16,500.00 |
| Earthwork (disposal of cut) | \$ 16.00 | cyd | 500 | \$ 8,000.00 |
| In-stream structures (boulders, logs, etc) | \$ 500.00 | each | 1 | \$ 500.00 |
| 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 | \$ 50.00 | each | | \$ - |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | 700 | \$ 4,900.00 |
| Potted Plantings (1 gal) | \$ 1.00 | each | 150 | \$ 150.00 |
| Cuttings Installation | \$ 30.00 | LF | | \$ - |
| Bioengineering Practices | \$ 3,000.00 | LS | 1 | \$ 3,000.00 |
| Erosion Control Installation | \$ 3,100.00 | week | 2 | \$ 6,200.00 |
| Construction Monitoring | | | | \$ - |
| Construction Total | | | | \$ 106,350.00 |
| Maintenance & Monitoring Costs | | | | |
| Invasive Weed Eradication maint | \$ 5,000.00 | acre/year | 5 | \$ 15,000.00 |
| Standard Maint (trash, weeds, erosion, etc) | \$ 3,000.00 | acre/year | 5 | \$ 15,000.00 |
| Hand/truck watering | \$ 800.00 | acre/visit | 5 | \$ 4,000.00 |
| LA/Bio monitoring of progress (qual & quan) | \$ 800.00 | year | 5 | \$ 4,000.00 |
| Reporting | | | | \$ - |
| 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

Cost Estimation for LVC-16



CITY OF CALABASAS

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: Inprinting | \$ 0.05 | S.F. | | \$ - |
| Seeding: Hand Broadcast | \$ 0.20 | S.F. | | \$ - |
| Plant Salvage & Replant: Tree Spade | \$ 50.00 | each | 20 | \$ 1,000.00 |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | 150 | \$ 1,050.00 |
| Potted Plantings (1 gal) | \$ 1.00 | each | 150 | \$ 150.00 |
| Cuttings Installation | \$ 30.00 | LF | | \$ - |
| Bioengineering Practices | \$ 3,000.00 | LS | 1 | \$ 3,000.00 |
| Erosion Control Installation | \$ 3,100.00 | week | 3 | \$ 9,300.00 |
| Construction Monitoring | | | | \$ - |
| 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

Cost Estimation for LVC-18



CITY of CALABASAS

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 | \$ 50.00 | each | | - |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | 50 | \$ 350.00 |
| Potted Plantings (1 gal) | \$ 1.00 | each | | - |
| Cuttings Installation | \$ 30.00 | LF | | - |
| Bioengineering Practices | \$ 1,000.00 | LS | 1 | \$ 1,000.00 |
| Erosion Control Installation | \$ 3,100.00 | week | 0.5 | \$ 1,550.00 |
| Construction Monitoring | | | | |
| 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 Baccharis 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/land Photos

Graphics & Figures\Site Locations\LVC-18.19.20.pdf
Photos\LVC19\LVC19.JPG

Cost Estimation for LVC-19



CITY of CALABASAS

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 | \$ 50.00 | each | | \$ - |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | 400 | \$ 2,800.00 |
| Potted Plantings (1 gal) | \$ 1.00 | each | | \$ - |
| Cuttings Installation | \$ 30.00 | LF | | \$ - |
| Bioengineering Practices | \$ 3,000.00 | LS | 1 | \$ 3,000.00 |
| Erosion Control Installation | \$ 3,100.00 | week | 2 | \$ 6,200.00 |
| Construction Monitoring | | | | \$ - |
| Construction Total | | | | \$ 61,204.80 |
| Maintenance & Monitoring Costs | | | | |
| Invasive Weed Eradication maint | \$ 5,000.00 | acre/year | 3 | \$ 9,000.00 |
| Standartd Maint (trash, weeds, erosion, etc) | \$ 3,000.00 | acre/year | | \$ - |
| Hand/truck watering | \$ 800.00 | acre/visit | 5 | \$ 12,500.00 |
| LA/Bio monitoring of progress (qual & quan) | \$ 2,500.00 | year | 5 | \$ 4,000.00 |
| Reporting | \$ 800.00 | year | | \$ - |
| 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\LVC20EucS2n.JPG
 Photos\LVC20\LVC20EucS2n.JPG

Cost Estimation for LVC-20



CITY of CALABASAS

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 |

| Bid Item | Unit Cost | Units | Quant | Cost |
|---|-------------------|-------|-------|--------------------|
| 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: Hand Broadcast | \$ 0.05 S.F. | | | |
| Seeding: Tree Spade | \$ 0.20 S.F. | | 6534 | \$ 1,306.80 |
| Plant Salvage & Replant: Tree Spade | \$ 50.00 each | | | |
| Plant Salvage & Replant: By Hand | \$ 7.00 each | | 100 | \$ 700.00 |
| Poited Plantings (1 gal) | \$ 1.00 each | | 100 | \$ 100.00 |
| Cuttings Installation | \$ 30.00 LF | | | |
| Bioengineering Practices | \$ 3,000.00 LS | | | |
| Erosion Control Installation | \$ 3,100.00 week | | 1 | \$ 3,100.00 |
| Construction Monitoring | | | | |
| Construction Total | | | | \$ 8,381.30 |

| Bid Item | Unit Cost | Units | Quant | Cost |
|---|-----------------------|-------|-------|---------------------|
| Maintenance & Monitoring Costs | | | | |
| Invasive Weed Eradication maint | \$ 5,000.00 acre/year | | 1 | \$ 5,000.00 |
| Standard Maint (trash, weeds, erosion, etc) | \$ 10,000.00 LS | | 1 | \$ 10,000.00 |
| Hand/truck watering | \$ 800.00 acre/visit | | 5 | \$ 4,000.00 |
| LA/Bib monitoring of progress (qua! & 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

Cost Estimation for LVC-23



CITY of CALABASAS

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 | \$ 50.00 | each | | \$ - |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | 250 | \$ 1,750.00 |
| Potted Plantings (1 gal) | \$ 1.00 | each | 250 | \$ 250.00 |
| Cuttings Installation | \$ 30.00 | LF | | \$ - |
| Bioengineering Practices | \$ 3,000.00 | LS | 1 | \$ 3,000.00 |
| Erosion Control Installation | \$ 3,100.00 | week | 3 | \$ 9,300.00 |
| Construction Monitoring | | | | \$ - |
| Construction Total | | | | \$ 189,424.40 |
| Maintenance & Monitoring Costs | | | | |
| Invasive Weed Eradication maint | \$ 5,000.00 | acre/year | 1 | \$ 5,000.00 |
| Standard Maint (trash, weeds, erosion, etc) | \$ 15,000.00 | LS | 1 | \$ 15,000.00 |
| Hand/truck watering | \$ 800.00 | acre/visit | 5 | \$ 4,000.00 |
| LAV/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

Cost Estimation for LVC-24



CITY of CALABASAS

| Standard Rough Order of Magnitude Costs | 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 | | - |
| Cleaning 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 | \$ 50.00 | each | | - |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | | - |
| Potted Plantings (1 gal) | \$ 1.00 | each | | - |
| Cuttings Installation | \$ 30.00 | LF | | - |
| Bioengineering Practices | \$ 3,000.00 | LS | | - |
| Erosion Control Installation | \$ 3,100.00 | week | | - |
| Construction Monitoring | | | | |
| 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 *Procambarus clarkii*, 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

Cost Estimation for LVC-25



CITY of CALABASAS

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 Space | \$ 50.00 | each | | - |
| Plant Salvage & Replant: By Hand | \$ 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 (quat & 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

Cost Estimation for LVC-29



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 | \$ 550.00 | 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 | \$ 50.00 | each | | - |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | | - |
| Potted Plantings (1 gal) | \$ 1.00 | each | 100 | \$ 700.00 |
| Cuttings Installation | \$ 30.00 | LF | 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 quantify discretely. 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

Cost Estimation for LVC-32



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, Renderings, models or photosimulations) | \$ 5,000.00 | LS | 1 | \$ 5,000.00 |
| Grading Plan | \$ 650.00 | each | 3 | \$ 1,950.00 |
| Planting Plan | \$ 2,500.00 | LS | 1 | \$ 2,500.00 |
| Irrigation Plan | \$ 1,600.00 | acre | 0.6 | \$ 960.00 |
| Erosion Control Plan | \$ 3,000.00 | acre | | \$ - |
| Specifications | \$ 400.00 | LS | 1 | \$ 400.00 |
| Client coordination and public outreach | \$ 2,000.00 | LS | 1 | \$ 2,000.00 |
| ACOE Nationwide permit | \$ 2,000.00 | year | 1 | \$ 2,000.00 |
| Water Quality Certification | \$ 6,000.00 | LS | 1 | \$ 6,000.00 |
| DFG 1600 agreement | \$ 3,000.00 | LS | 1 | \$ 3,000.00 |
| Design Total | \$ 3,000.00 | LS | 1 | \$ 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: Hydrosseeding | \$ 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 | \$ 50.00 | each | | \$ - |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | | \$ - |
| Potted Plantings (1 gal) | \$ 1.00 | each | 400 | \$ 2,800.00 |
| Cuttings Installation | \$ 30.00 | LF | 400 | \$ 400.00 |
| Bioengineering Practices | \$ 3,000.00 | LS | 1 | \$ 3,000.00 |
| Erosion Control Installation | \$ 3,100.00 | week | 4 | \$ 12,400.00 |
| Construction Monitoring | | | | \$ - |
| 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 | | \$ - |
| L/A/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 down/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

Cost Estimation for LVC-33



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) | \$ 2,000.00 | LS | 1 | \$ 2,000.00 |
| 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 | | | | \$ 6,910.00 |
| 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 | 0.14 | \$ 326.20 |
| Invasive Weed Kill (Arundo, Tamarisk, etc.) | \$ 15,000.00 | acre | | - |
| Traffic Control | \$ 400.00 | day | 2 | \$ 800.00 |
| 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 | each | 0.14 | \$ 210.00 |
| Seeding: Hydroseeding | \$ 0.10 | S.F. | 6098.4 | \$ 609.84 |
| Seeding: Imprinting | \$ 0.05 | S.F. | | - |
| Seeding: Hand Broadcast | \$ 0.20 | S.F. | | - |
| Plant Salvage & Replant: Tree Spade | \$ 50.00 | each | | - |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | | - |
| Potted Plantings (1 gal) | \$ 1.00 | each | 100 | \$ 700.00 |
| Cuttings Installation | \$ 30.00 | LF | | - |
| Bioengineering Practices | \$ 1,000.00 | LS | 1 | \$ 1,000.00 |
| Erosion Control Installation | \$ 3,100.00 | week | 0.5 | \$ 1,550.00 |
| Construction Monitoring | | | | \$ 7,796.04 |
| Construction Total | | | | \$ 7,796.04 |
| MAINTENANCE & MONITORING COSTS | | | | |
| Invasive Weed Eradication maint | \$ 5,000.00 | acre/year | 1 | \$ 5,000.00 |
| Standard Maint (trash, weeds, erosion, etc) | \$ 10,000.00 | LS | 1 | \$ 10,000.00 |
| Hand/truck watering | \$ 800.00 | acre/visit | 5 | \$ 7,500.00 |
| LA/Bio monitoring of progress (qual & quan) | \$ 1,500.00 | year | 5 | \$ 4,000.00 |
| Reporting | \$ 800.00 | year | | \$ 800.00 |
| M&M Total | | | | \$ 21,500.00 |
| Project Total | | | | \$ 36,206.04 |

Project Description

LVC35 is listed in the master plan as "Pull back banks, create/restore wetlands." There was very little evidence at the site to differentiate it from the typical condition along this general reach of the Creek. Recontouring the banks in this area would be expensive and would temporarily impact high quality riparian habitat, therefore we do not recommend earthwork at this site. Our more limited suggestions are below. Access is possible from Las Virgenes Rd, but traffic control will be necessary for exiting and entering the road.

Recommendations

Do not recontour the banks; it would impact high quality habitat. Instead, expand riparian forest plantings as far as conditions will allow, roughly .14 acre, and implement a 3-5 year maintenance and monitoring program.

Assumptions

1. No broad-level issues would require or suggest bank recontouring in this area.
2. No construction documents are necessary.
3. No supplemental watering is necessary.

Project Benefits

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

Site Map and Photos

- Graphics & Figures\Site_Locations\LVC-35_36.pdf
- Photos\LVC35\LVC35DrainageE2W.JPG
- Photos\LVC35\LVC35DrainageOutletW2E.JPG
- Photos\LVC35\LVC35DrainageSW2NE.JPG
- Photos\LVC35\LVC35DrainageW2E.JPG

Cost Estimation for LVC-35



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 | \$ 50.00 | each | | |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | 300 | \$ 2,100.00 |
| Potted Plantings (1 gal) | \$ 1.00 | each | | |
| Cuttings Installation | \$ 30.00 | LF | | |
| Bioengineering Practices | \$ 3,000.00 | LS | 1 | \$ 3,000.00 |
| Erosion Control Installation | \$ 3,100.00 | week | 3 | \$ 9,300.00 |
| Construction Monitoring | | | | |
| 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 | | |
| LAI/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-36.pdf
Photos\LVC36\LVC36.JPG

Cost Estimation for LVC-36



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 | 1 | \$ 3,000.00 |
| 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 | 10 | \$ 150,000.00 |
| 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 | \$ 50.00 | each | | \$ - |
| Plant Salvage & Replant: By Hand | \$ 7.00 | each | 200 | \$ 1,400.00 |
| Potted Plantings (1 gal) | \$ 1.00 | each | 100 | \$ 100.00 |
| Cuttings Installation | \$ 30.00 | LF | 60 | \$ 1,800.00 |
| Bioengineering Practices | \$ 3,000.00 | LS | 1 | \$ 3,000.00 |
| Erosion Control Installation | \$ 3,100.00 | week | 2 | \$ 6,200.00 |
| Construction Monitoring | | | | \$ - |
| Construction Total | | | | \$ 34,705.80 |
| Maintenance & Monitoring Costs | | | | |
| Invasive Weed Eradication maint | \$ 5,000.00 | acre/year | 1 | \$ 5,000.00 |
| Standard Maint (trash, weeds, erosion, etc) | \$ 10,000.00 | LS | 1 | \$ 10,000.00 |
| Hand/truck watering | \$ 800.00 | acre/visit | 5 | \$ 4,000.00 |
| LAV/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\LVC41VinceBanks.JPG

Cost Estimation for LVC-41



CITY of CALABASAS

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 | \$ 1,500.00 | 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 |
| Biengineering 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

Cost Estimation for LVC-42



CITY OF CALABASAS

Cost Estimation for other Las Virgenes Sites

| Construction Code | Project Codes | Project Description | Study & Design Cost | Construction & Inspection Cost | Total Design & Construction | Projected O & M Costs | Comments | Priority |
|-------------------|---------------|---|---------------------|--------------------------------|-----------------------------|-----------------------|---|----------|
| QL-01 | LVC-01 | Stabilize Headcut | 7,920 | 26,400 | 34,320 | 6,000 | | Medium |
| | LVC-02 | Monitor Channel Incision | 1,500 | 5,000 | 6,500 | 5,000 | | Medium |
| | LVC-03 | Create/Restore Wetlands | 15,000 | 50,000 | 65,000 | 24,000 | | Medium |
| | LVC-04, 12A | Remove Concrete, Re-establish Soft Bottom | 200,000 | 3,800,000 | 4,000,000 | 30,000 | 2,000' concr. channel likely having signif. downstream geomorphic destabilizing effect. | High |
| | LVC-05 | Remove Obstructions and Rework Channel | 4,500 | 15,000 | 19,500 | 0 | | Low |
| | LVC-06 | Improve Detention Basin | 12,210 | 40,700 | 52,910 | 12,000 | | Low |
| | LVC-09 | Remove Rip-Rap | 241,130 | 3,937,100 | 4,178,230 | 77,000 | | Medium |
| | LVC-10 | Monitor Channel Incision | 1,500 | 5,000 | 6,500 | 0 | | High |
| | LVC-11 | Create/Restore Wetlands | 1,200 | 4,000 | 5,200 | 5,000 | | Medium |
| | LVC-15 | Stabilize Bank | 5,700 | 19,000 | 24,700 | 7,000 | | Low |
| | LVC-17 | Remove Portion of Parking Lot and Create/Restor | 4,500 | 15,000 | 19,500 | 2,000 | | Low |
| | | | 30,000 | 100,000 | 130,000 | 10,000 | Small sediment reduction benefit; requires buying land | Low |
| | LVC-21 | Pull Back Banks | 13,800 | 46,000 | 59,800 | 10,000 | | Medium |
| | LVC-22 | Stabilize Channel | 18,540 | 61,800 | 80,340 | 24,000 | | Medium |
| | LVC-26 | Remove Barrier to Fish Movement | 75,240 | 250,800 | 326,040 | 58,000 | | Medium |
| | LVC-27 | Remove Cribwall | 0 | 3,500 | 3,500 | 0 | | Medium |
| | LVC-28 | Stabilize Banks | 60,000 | 200,000 | 260,000 | 20,000 | | Low |
| | | | 14,490 | 48,300 | 62,790 | 12,000 | | Medium |



CITY of CALABASAS

Cost Estimation for other Las Virgenes Sites

| Construction Code | Project Codes | Project Description | Study & Design Cost | Construction & Inspection Cost | Total Design & Construction | Projected O & M Costs | Comments | Priority |
|-------------------|---------------|--|---------------------|--------------------------------|-----------------------------|-----------------------|---|-------------|
| | LVC-30A | Remove Barrier to Fish Movement | 50,000 | 200,000 | 250,000 | 20,000 | Would open up 1/4 mile of good quality fish habitat to Meadow Creek Lane. | High |
| | | | 124,490 | 451,800 | 576,290 | 52,000 | | Low to High |
| QL-04 | LVC-31 | Stabilize Ravine | 5,760 | 19,200 | 24,960 | 5,000 | | Medium |
| QL-05 | LVC-34 | Remove Barrier to Fish Movement | 2,000 | 25,000 | 27,000 | 2,000 | | Low |
| QL-06 | LVC-37 | Pull back banks. Create/restore wetlands. | 34,500 | 115,000 | 149,500 | 5,000 | Repair not recommended; no infrastructure in danger. | Low |
| | LVC-38 | Stabilize Headcuts | 75,000 | 250,000 | 325,000 | 5,000 | Not recommended | Low |
| | LVC-39 | Monitor Incised Side Drainage and Sewer Pipeline | 2,100 | 7,000 | 9,100 | 2,000 | | High |
| | LVC-40 | Pull Back Banks; Create/Restore Wetlands | 18,000 | 60,000 | 78,000 | 10,000 | | |
| | | | 129,600 | 432,000 | 561,600 | 22,000 | | |
| QL-07 | LVC-43 | Remove Barrier to Fish Movement | 50,000 | 160,000 | 210,000 | 20,000 | Opens add'l. 1.2 miles of fish habitat to Lost Hills Rd. box culvert. | High |
| QL-08 | LVC-44 | Stabilize Banks | 72,600 | 242,000 | 314,600 | 24,000 | No infrastructure endangered at top of bank | Low |



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(850 L.F. upstrm of Thousand Oaks, 950 L.F. downstrm to Mureau, 200 L.F. Mureau to Hwy 101 Calabasas - LYC-04, 12A (remove concrete bottom, 1,800 L.F.) ENGINEERS ESTIMATE

| Item No. | Description | Unit | Est. Qty. | Unit Price | Total |
|----------|---|--------------|--------------|------------------------|--------------------------------|
| 1 | Mobilization/Installation of Construction and Protective Fencing | L.S. | Job | \$25,000.00 | \$25,000.00 |
| 2 | Superintendence and Site Management | L.S. | Job | \$10,000.00 | \$10,000.00 |
| 3 | EXISTING CONCRETE RETAINING WALL FOUNDATION AND SUPPORT Core Slab/Drill 16" x 16 ft. deep/Install H-beams/Backfill with concrete, piers 5 feet on center both sides Construct new 2' x 3' grade beam at base of concrete side walls | Each L.F. | 800 4000 | \$1,500.00 \$100.00 | \$1,200,000.00 \$400,000.00 |
| 4 | DEMOLITION Sawcut, remove bottom of box culvert. Dispose of concrete/steel/debris. | S.Y. Ton | 4,500 800 | \$15.00 \$75.00 | \$67,500.00 \$60,000.00 |
| 5 | Grade, haul, dispose of soil for excavating low flow channel | C.Y. | 14,000 | \$40.00 | \$560,000.00 |
| 6 | Rock Check Grade Control every 50' | Ton | 15000 | \$100.00 | \$1,500,000.00 |
| 7 | PREPARE AND IMPLEMENT A SWPPP | L.S. | Job | \$15,000.00 | \$15,000.00 |
| | TOTAL | | | | \$3,837,500.00 |



Las Virgenes Creek Notes

| |
|--|
| <p><u>LVC-01 - LA County Flood Control District (LACFCD).</u> Proj. site at upper end of concr. flood control channel. 8'-10' high vertical cut in bank along approx. 75' of channel, with transition repair area about 125'-135'. (1) Lay back bank slope, install rock toe protection & rock checks (2). Grading - 2-1 8 x 16 x 135 / 2 x 27 + 320; toe 3 x 3 x 135 / 27 = 45. 320 + 45 = 365 yds x \$30/yard = \$10,950 earthwork. Rock work - 3 x 7 x 135 = 2,835 / 27 = 105 tons x \$80/ton = \$8,400 = \$19,350. Mobilization & Misc. - allow \$7,000 = \$26,350. Annual O&M - \$6,000.</p> |
| <p><u>LVC-02 - LACFCD ROW? Monitor Channel Incision.</u> Natural channel starting to incise at upper end of LACFCD concrete channel. Monitoring would involve controlled survey & digital photo shoot every 2-3 years, and after major storm and flood events. Allow \$5,000 O&M/5 years.</p> |
| <p><u>LVC-03 - Create/Restore Wetlands - LACFCD.</u> Site located adj. to an existing open space area @ upper end of Las Virgenes (LV) Rd., adj. to Santa Monica Mtns. NRA (SMNRA). Small wetland/cattail area @ end of natural channel & begin. of concr. Channel above where side tributary enters channel. Large, open grassy area, gently sloping w/in LACFCD ROW provides opportunity to create seasonal wetland & oak woodland adj. to channel. Proj. would involve excavation of stream-side seasonal/depression wetlands, planting native riparian trees along top of bank, & native oaks in grassland area. Grassland = about 1-2 acres in size. Depending on size of wetlands restoration, scope could be \$15,000 to \$50,000 or more. Allow \$45,000 for proj. implem. & coordin. w/ SMNRA adj. restoration efforts+ \$5,000 for inspection = \$50,000. Proj. feasible but req. coop. w/ National Park Service and LACFCD O&M, inspect, replant, allow \$12,000 for 2 years = \$24,000.</p> |
| <p><u>LVC-04 - Remove Concr., Re-establish Soft Bottom - LACFCD Channel.</u> Largest/most signif. on proj. list. appr. 2,000-l.f. channel btwn. Hwy 101 & upper end of LV Rd. Channel appr. 25' W, concr. bottom, 20'-25' depth. Upper 2/3 w/ 2:1 side slopes/temp. slope, w/ portions near Mureau Rd. rectang. concr. box. Silt accum. btwn. Mureau Rd. & Hwy 101, w/ some sapling willows--could scar out @ large flood & move downstream. Entire concr. channel could be removed/restored, similar to exist. proj. below Agoura, but stability more challenging w/ sleeper grade & condos at top of bank. High liability - bank slope failure danger to adj. apt. bldgs. More feas. to remove/soften channel bottom only, & incr. sideslope roughness. Via rock boulders placed at regular intervals to roughen channel. Involves 1) demol. of concr. bottom, 2) inst. of drilled, poured-in-place concr. piers - 15' long, 18" dia. 5' o.c., 3) concr. toe & grade beam along & tying piers together, 4) inst. of rock checks at 50' spacing, 5) channel low-flow grading, 6) drilling & inst. of PVC rings on channel sideslope for planting. May not be tech. & polit. feas., req. approval by LACFCD & several million \$ in grants. Should complete more in-depth feas. study / prelim. design \$40,000, cost estimate is for \$3.8 million.</p> |
| <p><u>LVC - 05 - Remove Obstructions and Rework Channel.</u> Channel likely private? County unincorp. area? Small tributary to LVC, several flow obstructions, blockages in channel, small channel would need to be regraded. Est. cost @ \$15,000, incl. field engr. & inspect. No O&M required.</p> |
| <p><u>LVC-06 - Improve Detention Basin.</u> Det. basin belongs to LACFCD?, ± 2 acres in size, flat bottom, grassed, w/ concr. headwall/outlet on side trib. to LVC with outlet under Las Virgenes Rd. . Improvements could incl. deepening portion to create ponded seasonal wetland, planting willows & cottonwoods, oaks on edge of basin to impr. habitat, sage scrub & oak on sideslopes of adj. open space hills. Excavation: 1/4 acre pond, 3' D = 1,210 cu. yd. @ \$20/cu. yd. = \$24,000; planting 1/2 acre @ \$25,000/acre = \$12,500 = \$36,700 total; \$4,000 inst. = \$40,700. O&M: wetland would need to be re-excavated/replanted every 3-5 yrs @ \$10,000-\$12,000. Could spend more depending on size of arealscope of habitat improvements.</p> |
| <p><u>LVC-09 - Remove Riprap - Caltrans ROW.</u> Riprap along LVC in Caltrans ROW near Hwy 101 overcrossing @ LV Rd. Some bank/slope protection needed-embankment & natural slope above. Probably challenging to convince Caltrans to remove riprap & repl. w/ less durable/less protective blotech. structure @ major hwy overcrossing. Possible to joint plant willow cuttings in and around. Some grouted rip-rap.. Allow \$5,000 for joint planting only. Probably not feasible to remove riprap from CalTrans ROW.</p> |
| <p><u>LVC-10 - Monitor Channel Incision - Caltrans ROW.</u> High danger of channel incis. & downcutting due to extensive amt. of concr. channel upstream creating high velocities & hungry water effect. Photograph/survey channel to establ. bed profile. Allow \$4,000 survey, \$5,000 O&M for follow-up for 5 yrs. Consider rack grade control structures as needed.</p> |



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| <p>LVC-11 - Create/Restore Wetlands. Caltrans ROW. Opportunity to impr. habitat along LVC in natural channel area along creek immed. above Hwy 101. Would involve weed removal, possib. minor grading to create creek channel bench at OHW., planting of tree willows, sycamores, cottonwoods. Approx. 1/4 acre. Depending on scope, grading and planting could cost \$12,000-\$15,000, based on 1/4 acre size & restoration cost of \$50,000/acre. Allow \$15,000 + \$4,000 inspect. = \$19,000. \$7,000 O&M.</p> |
| <p>LVC-15 - Stabilize Bank. Private Property? Small bank stability problem on tribut. to LVC. Would incl. placing rock check & rock riprap to stabilize. Allow \$15,000-\$20,000, incl. Site inspection. Allow \$2,000 for inspect./repair following yr. as part of O&M.</p> |
| <p>LVC-17 - Remove Portion of Parking Lot & Create/Restore Wetland. Priv. property. Top of bank, well above creek, overflow parking for Mexican restaurant. Rock riprap on slopes below. Would involve removing asphalt & planting native trees. Value/Feasibility questionable-creek well shaded in area, on private property. Allow \$15,000, possib. \$100,000 or more if need to buy land.</p> |
| <p>LVC-21 - Pull Back Banks. Priv. property (Steeplechase Apts., 4240 Lost Hills Rd.). City may have maintenance easement as locked pipe gate at Lost Hills Rd. - maintenance road intersection. 3-4 small gullies from water dir. off dirt maint. rd. well above channel and behind apartment buildings. 1 or 2 existing gully problems repaired by rock placement. Over-irrig. & broken irrig. pipes contribute. Probably not feas. to "pull back." Some abandoned-irrig., indicating a mitg. area. Best to inslope rd. to inside ditch & d.I. structure @ stable points or inst. water bars & rd. drainage struct., + more localized grading & inst. rock checks, erosion contr. matting & straw wattles. 12 water bars @ \$200 = \$2,400; reslope rd. & inside ditch = \$3,500; inst. 2 drop inlets w/ rock energ. dissip., regrade 3 20'x40' gully areas (3 days work) = \$5,000; Rock placem. = \$7,000; eros. contr., blankets, straw watt. = \$12,000; seed/plant 1/4 acre @ \$50,000 = \$12,500; = \$42,400. Total costs \$42,000, plus \$4,000 inspection = \$46,000. O&M: \$5,000/yr - 2 yrs = \$10,000.</p> |
| <p>LVC-22 - Stabilize Channel. Priv. property, dense to open euc. stand along 50'-75' W nearly level terrace, fenced from condo proj. - Willow Glen St. area. Banks vertical & eroded along portions of 500'-600'. Some failed from topped tree. Problem could become worse if channel continues to incise. Project would involve laying back banks in upper 10' at 2:1, appl. coir eros. contr. blanket, biologs, replanting, esp. behind Canyon Church. Concern over channel bottom incis., but access for constr. is bad. Consider use of 18" rock grade contr. struct. ltd. Log back 2:1 upper 10'. 50 - 200 1/2 = 100 cu. ft./ft. = 3.7 cu. ft./ft. x 500 l.f. = 1,851 cu. yd. @ \$20/cu. yd. = \$37,020; eros. contr. blanket inst. 500 x 16 l.f. blanket = 8,000 ft² / 9 = 900 yd² @ \$11/sq. yd. inst. = \$9,800; planting 500 x 16 = 8,000 ft² slope = 0.2 ac. @ \$50,000/ac. = \$10,000; 56,8000 + mob. of \$5,000 = \$61,800. O&M: \$8,000/yr, 3 yrs. = \$24,000, mostly plant maint. & weeding.</p> |
| <p>LVC-25 - Remove Fish Barrier. Private (?), but LACFCD may have maint. rights. Barrier appears to be pipe, rubble, woody debris in channel immed. upstream of Wright School & near waterline crossing. Does not appear on Heal the Bay Fish Passage Inventory. Would take City crew of 2-3 one day to cut up & remove. \$3,500, no inspect. design, maint. costs needed.</p> |
| <p>LVC-27 - Remove Cribwall. Channel prob. City property, maybe LACFCD. Removal not recommended-in potentially unstable area of LVC (e.g., problems @ LVC 30 - concrete wall failure @ Archstone). Conduct feas. study to determine if softer approach possible. High liability, concr. walls, corrug. pipe containers, etc. Dep. on amt. of work, \$400-\$500/l.f. for maybe 400 l.f. = \$200,000. Min. Restoration & NRCS have worked in reach doing - planting & restoration.</p> |
| <p>LVC-28 - Stabilize Banks. Bank failure along Archstone Greenway, approx. 600 l.f., prob.combination of LACFCD & private property. Overbank lawn runoff, over-irrig., etc. partially causing problem. Upper bank repair probably can be handled by purely biotech. methods. Intercept lawn runoff in edge of grass berm/ditch & dir. to stable spots. Inst. small dia. coir fiber rolls, willow cuttings & willow wattles. Type 1 bank repair: \$70-\$80/l.f. x 600 l.f. = \$42,000; + 15% inspection = \$48,300. O&M: \$6,000/yr., 2 yrs = \$12,000. Also consider 12" rock drops to combat channel incis. problem along reach, as part of larger control of reach wide channel instability. Problems in this reach and downstream may reflect both changed urban hydrology and possibly effects of channel straightening and armoring upstream. Needs a comprehensive hydraulic/geomorphic study.</p> |
| <p>LVC-30A - Remove Fish Barrier - Lost Hills Rd. Culvert. Belongs to City of Calabasas. @ Juan Bautista Park. Not incl. in LVC, McCoy, Dry Canyon Creek 2003 Master Plan, but on 2005 Heal the Bay Fish Migr. Barrier Study. Obstr. incl. inlet apron & 4, 14x14x300 box culverts. Outer openings accum. sed. Culvert a depth & velocity barrier. Would involve adding veloc., reduc. baffles, low-flow channel in center box by adding weirs, concr. wall, or sill struct. poured on concr. bottom. Not feas. to repl. box culverts w/ clear span bridge (300' L), or soften bottom. Based on similar proj. @ Hwy 101 crossing of SLO creek (165' L) @ Los Osos Valley Rd., cost est. @ \$200,000. Allow \$10,000/yr O&M, 3 yrs. for inspect/repair.</p> |



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| <p><u>LVC-31 - Stabilize Ravine.</u> Malibu State Park property. Side tribut. to LVC, gulying in resp. to watershed changes & probably instab. of LVC. Would involve placing 3-4 rock checks in ravine & some wire brush checks. Access along trail from City's Bautista Park. Trail could be endangered. Approx. 200 tons of rock @ \$80/ea. = \$16,000; 20% inspect. & field design = \$3,200; = \$19,200. Monitor to determine if hiking trail endangered by gully advance.</p> |
| <p><u>LVC-34 - Remove Barrier to Fish Movement.</u> Local obstruction barrier, not on Heal the Bay inventory, so assumed low priority. Small barrier/obstruction involving crane work & rock drop/step pool. Allow \$25,000 & field engineer.</p> |
| <p><u>LVC-37 - Pull Back Banks: Create/Restore Wetlands.</u> LVC-37 & LVC-38 as one proj. Malibu State Park. Creek naturally incised, localized relatively small +/-100' bank erosion problem sites, but incision and instabilities may be worsening as bank stability problem on east (Malibu Cyn. Rd.) side of creek also. Access difficult. Repair might incl. laying slope back or benching & would be diffic., would need to transition upstream/downstream. 200 l.f. @ \$500/l.f. = \$100,000; + 15% inspection = \$115,000. O&M: \$8,000 inspect eros. contr. blanket & \$7,000 plant maint.</p> |
| <p><u>LVC-38 - Pull Back Banks: Create/Restore Wetlands.</u> Malibu State Park. Same as above - vert. bank @ outside of meander, slightly smaller. Cost same as above +\$105,000. O&M: inspect eros. contr. blanket & plant maint. If 37&38 completed as one, budget would be about \$250,000 - \$300,000 to address channel instability issues below Lost Hills Rd. on Park property. Need to complete a comprehensive hydraulic and geomorphic study of creek and address problems from an overall integrated perspective, otherwise there is a danger of just "chasing" problems and merely moving problems caused by watershed scale hydrology changes cross-bank and downstream. This needs to be coordinated with State Parks.</p> |
| <p><u>LVC-39 - Monitor Incised Drainage & Sewer Pipeline Crossing.</u> LV Sanitary District easement. Sanitary sewer runs along east bank close to top of bank, much of LV-Malibu Rd., then crosses creek @ this point. Incipient erosion. Notify Sanitary District, survey location, & start hot-linked photo log. Probably budget \$7,000 to establish a profile survey of this area, should be repeated every 2-3 years or after big storm events. \$5,000 repeat monitoring & brief reports.</p> |
| <p><u>LVC-43 - Pull back banks and restore wetland.</u> Project is along lower portion of LVC within Malibu State Park. Appears to be large 20'x 80' vertical bank on east side of creek just below entry road to water company yard. As with LVC 37 and 38 the creek is naturally incised and these features at bends can be important as pools form along these reaches. However, continuing channel incision can destabilize the banks. Laying back the banks to create wetlands would be difficult and expensive, and adding a rock toe would move potential instability problem downstream. Bank repair costs are level 4, 80 l.f. x \$500/l.f. = \$40,000, plus upstream and downstream 20 feet each end = 40 additional l.f. for \$60,000, including inspection. No infrastructure immediately in danger-but sewer pipe parallels top of bank.</p> |
| <p><u>LVC-43 - Remove Fish Passage Barrier.</u> Malibu State Park property, White Oak Dam, although 2003 Master Plan & 2005 Heal the Bay study show slightly different locations. 6-ft H concr. dam (White Oak). Remove 3.5' - 4.5' of concr. dam, leaving 1.5' - 2.0' in place. Provide fish passage over dam by constr. series of rock step pools, 8"-12" H, beginning downstream. Some upstream sed. excavation may be necessary. Area of dense riparian woodland and poor access, so constr. impacts & permitting difficult. Based on similar project on Stage Coach Rd., upper SLO Creek, est. cost = \$160,000, + design, CEQA, permitting of \$50,000. O&M to inspect/repair rock checks, allow \$20,000.</p> |
| <p><u>LVC-44 - Stabilize Banks.</u> Malibu State Park Property. 2 steep (near vert.) 25' H x 120' L banks eroding on opposite side of lower LVC, downstream from bridge access to State Park employee residence. Level 4, \$600/l.f. Would involve laying back slopes & placing rock toe or 2 fiber rolls & willow staking. Appear to be historic problems, but could worsen as channel incis. incr. Est. 350 l.f. @ \$600/l.f. = \$210,000; allow 15% inspection = \$241,500. O&M: inspect, monitor & maint. plants = \$8,000 yr., 3 yrs., = \$24,000.</p> |

