

LAS VIRGENES CREEK NOTES

LVC-01 - LA County Flood Control District (LACFCD). 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/yd = \$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.

LVC-02 - LACFCD ROW? Monitor Channel Incision. 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.

LVC-03 - Create/Restore Wetlands - LACFCD 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/depressional 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.

LVC-04 - Remove Concr., Re-establish Soft Bottom - LACFCD Channel. 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/ steeper grade & condos at top of bank. High liability - bank slope failure danger to adj. apt. bldgs. More feas. to remov./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 & tiering 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**.

LVC - 05 - Remove Obstructions and Rework Channel. 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.

LVC-06 - Improve Detention Basin. 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 area/scope of habitat improvements.

LVC-09 - Remove Riprap - Caltrans ROW. 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 biotech. 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.

LVC-10 - Monitor Channel Incision - Caltrans ROW. 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.

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.

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.

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.

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 placment. Over-irrig. & broken irrig. pipes contribute. Probably not feas. to "pull back." Some abandoned-irrig., indicating a mitig. area. Best to inslope rd. to inside ditch & d.l. 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.

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 toppled 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 @ \$1h/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.

LVC-26 - 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.

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**. Mtn. Restoration & NRCS have worked in reach doing - planting & restoration.

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.

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.

LVC-31 - Stabilize Ravine. Malibu State Park property. Side tribut. to LVC, gullying 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.

LVC-34 - Remove Barrier to Fish Movement. 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.

LVC-37 - Pull Back Banks: Create/Restore Wetlands. 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 transitioin 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.

LVC-38 - Pull Back Banks: Create/Restore Wetlands. 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.

LVC-39 - Monitor Incised Drainage & Sewer Pipeline Crossing. 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.

LVC-43 – Pull back banks and restore wetland. 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.

LVC-43 - Remove Fish Passage Barrier. 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.

LVC-44 - Stabilize Banks. 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.