

Geomorphic Assessment of Town of Fairfax Project Sites
Appendix G Complete Site Classification and Location Data

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	A-50	44,008	44,269	261	CLASS A	NO-ACTION	3-4 ft-high floodplain unit overlies dense gr alluvium with shallow amended soil cap; Cascade Preserve begins at Town of Fairfax limits at u/s end of site
SA CK RB	S-70	43,857	44,008	151	RR BANK	NO-ACTION	Good condition
SA CK RB	S-69	43,831	43,857	26	BDGE	NO-ACTION	Pvt driveway bdge crossing; 28.5 ft-wide by 7.7 ft-high clear-span pvt driveway bridge with grouted rock apron and mid-bank vert conc ret wall abutments; does not appear a flood constriction
SA CK RB	A-49	43,777	43,831	54	CLASS A	NO-ACTION	Stable position; dense gr alluvium in toe; well-vegetated
SA CK RB	B*-22	43,730	43,777	47	CLASS B*	ACTION	Failed u/s section of vert conc ret wall at slightly outside ch bend position; Recommend stabilizing bank in failed section and u/s from failed section to prevent additional outflanking of failed, overturned wall structure; May be possible to stabilize site using combination of bank regrading and MSE soil lifts and carefully designed cabled RR-LWD rootwad structures to deflect LB erosion pressure past site
SA CK RB	B-21	43,696	43,730	34	CLASS B	NO-ACTION	Failure of upstream end of vert conc ret wall exposes loose random backfill and compromises stability of entire wall; No mature native trees or structures threatened; Gradual bank slope at site; Stabilizing site would achieve sediment source site reduction objective and prevent possibility that continuing incremental wall failures may cause LB erosion d/s; overall low priority site
SA CK RB	B*-21	43,666	43,696	30	CLASS B*	ACTION	TOB utility pole at near-vertical section with overhanging loose alluvium threatened by recent and continuing minor bank erosion in straight ch reach; Recommend lining bank with vegetated RR to protect utility pole
SA CK RB	S-68	43,632	43,666	34	RR BANK	NO-ACTION	Facing class RR placed on bank to protect undercut bay at 8 ft where tributary stream and local SD drainage discharges onto TOB
SA CK RB	A-48	43,506	43,632	126	CLASS A	NO-ACTION	Stable 1(H):2(V) sloped natural ch bank composed of dense gr alluvium; site appears prone to minor bank failure if low-flow ch switches from LB to RB due to LWD blockage, bank failure, or new encroached stabilization structure in reach
SA CK RB	S-67	43,433	43,506	73	RR BANK	NO-ACTION	Grouted
SA CK RB	A-47	43,392	43,433	41	CLASS A	NO-ACTION	Relatively stable 1(H):2(V) sloped natural ch bank composed of dense gr alluvium; site appears prone to minor bank failure if low-flow ch switches from LB to RB due to LWD blockage, bank failure, or new encroached stabilization structure in reach
SA CK RB	S-66	43,372	43,392	20	RR TOE WALL	NO-ACTION	Good condition

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SA CK RB	C-6	43,352	43,372	20	CLASS C	ACTION	Undercut mature native mid-bank trees subject to failure; minimal RR toe protection at site; Recommend adding mix of 1/8-ton and 1/4-ton RR pieces to bank up to base of threatened trees, and/or placing LWD cabled to 1/2-ton RR pieces to deflect erosion pressure past site
SA CK RB	S-65	43,310	43,352	42	RR TOE WALL	NO-ACTION	RR pieces placed along toe of bank only
SA CK RB	A-46	43,265	43,310	45	CLASS A	NO-ACTION	Relatively stable ch position; prone to minor failure if channel switches due to debris blockage
SA CK RB	S-64	43,208	43,265	57	RR TOE WALL	NO-ACTION	RR pieces placed along toe of bank only
SA CK RB	A-45	43,197	43,208	11	CLASS A	NO-ACTION	Bank appears composed of loose random fill; TOB fence but no structures appear threatened if low-flow ch switches from LB to RB due to LWD debris blockage; u/s bank failure, or new encroached stabilization structure
SA CK RB	S-63	43,086	43,197	111	RR TOE WALL	NO-ACTION	Good condition
SA CK RB	S-62	43,021	43,086	65	RR TOE WALL	NO-ACTION	Grouted; RR keyed into dense clay
SA CK RB	A-44	42,900	43,021	121	CLASS A	NO-ACTION	Dense clay exposed in toe of bank, well-vegetated
SA CK RB	B-20	42,865	42,900	35	CLASS B	ACTION	Recent minor lower and mid-bank erosion exposing 5 ft-high clay horizon; Loose random fill material overlies clay bank material and extends up to Canyon Rd roadbed at approx. 1(H):3(V) slope; Upper bank erosion likely to continue and eventually threaten roadbed; Recommend constructing rock-filled timber crib wall at max 1(H):4(V) slope from WSE + 5 ft up to edge of Canyon Road with toe of structure excavated into existing clay material exposed in toe of bank; Also recommend installing cabled RR-LWD structures along toe of bank to deflect erosion pressure off of exposed clay bank (i.e., footing)
SA CK RB	S-61	42,857	42,865	8	RR TOE WALL	NO-ACTION	RR toe wall; Stable; Good condition
SA CK RB	S-60	42,827	42,857	30	VERT TIMBER RET WALL	NO-ACTION	Upstream end of vert timber ret wall failed; appears self-stabilizing
SA CK RB	S-59	42,742	42,827	85	RR BANK	NO-ACTION	RR bank; Canyon Road bed at WSE + 12 ft; Note: Recommended canopy enhancement site within and above d/s 50 ft of RR bank site
SA CK RB	S-58	42,685	42,742	57	VERT CONC RET WALL	NO-ACTION	Stable; Good condition
SA CK RB	S-57	42,478	42,685	207	RR BANK	NO-ACTION	RR bank; Stable; Good condition
SA CK RB	A-43	42,340	42,478	138	CLASS A	NO-ACTION	Stable inside bend ch position with heavily vegetated fp bench; Recent toe erosion along remnant fp bench appears adjustment to encroachment by relatively new constructed u/s LB RR bank; fp bench toe erosion appears self-stabilizing
SA CK RB	S-56	42,143	42,340	197	RR BANK	NO-ACTION	5 ft-high RR bank; Appears encroached 5-8 horiz ft at location 50 ft from u/s end

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/ Structure Class	Recommend Action/ No-Action	Site/Structure Description
SA CK RB	A-42	41,868	42,143	275	CLASS A	NO-ACTION	Stable inside bend ch position with wide gr bar and narrow fp bench along edge of bank; upper 40 ft length prone to erosion if low-flow ch switches from LB to RB due to LWD blockage, u/s bank failure, or new structure encroachment
SA CK RB	S-55	41,772	41,868	96	RR BANK	NO-ACTION	6 ft-high RR bank; Stable; Good condition
SA CK RB	A-41	41,735	41,772	37	CLASS A	NO-ACTION	Bank composed of unstable, loose random fill, but well vegetated and in relatively protected ch position d/s from RR bank; Site prone to severe erosion if low-flow ch switches sides from LB to RB due to LWD blockage, u/s bank failure, or new structure encroachment
SA CK RB	S-54	41,650	41,735	85	FABRIC TOE	NO-ACTION	Recently placed biodegradable geofabric toe/apron on mixed rock RR and gravel point bar; Fabric staked but not vegetated, irrigated
SA CK RB	A-40	41,610	41,650	40	CLASS A	NO-ACTION	Stable inside bend ch position u/s from d/s encroached rip-rap bank; fp bench with recent fine sed deposit along toe of bank
SA CK RB	S-53	41,451	41,610	159	RR BANK	NO-ACTION	RR bank along straight through outside bend ch positions; appears to have encroached into the ch 10-15 horiz ft; Soil-covered RR on bank above approx. WSE + 7 ft; Note: recommended canopy enhancement site
SA CK RB	S-52	41,306	41,451	145	RR BANK	NO-ACTION	RR bank; Grouted where TOB concrete flume SD discharges onto RR bank
SA CK RB	A-39	41,211	41,306	95	CLASS A	NO-ACTION	Stable inside bend ch position; gr bar and fp bench with recent fine sediment deposition along toe of bank
SA CK RB	S-51	41,156	41,211	55	RR BANK	NO-ACTION	1/4-ton RR bank; heavy vegetative cover (non-native ivy); RR bank appears to end at property bdy and not continue d/s through entire outside bend
SA CK RB	A-38	41,120	41,156	36	CLASS A	NO-ACTION	Naturally unstable outside bend ch position undergoing recent and long-term progressive erosion, Recommend monitor site stability as may affect Canyon Road foundation directly above site; Site should be stabilized as part of recommended Canyon Rd Bridge fish ladder replacement project
SA CK RB	S-50	41,090	41,120	30	RR TOE WALL	NO-ACTION	1/4-ton RR lining toe of bank; Good condition; Site should be stabilized as part of recommended Canyon Rd Bridge fish ladder replacement project
SA CK RB	S-49	41,072	41,090	18	RR BANK	NO-ACTION	1/4-ton to 1/2-ton approx. 20 ft-high RR dumped on bank from Canyon Road to reinforce bank failure where tributary stream and other local stormwater discharges onto TOB; Site should be stabilized as part of recommended Canyon Rd Bridge fish ladder replacement project
SA CK RB	A-37	41,051	41,072	21	CLASS A	NO-ACTION	Stable; Site should be stabilized as part of recommended Canyon Rd Bridge fish ladder replacement project
SA CK RB	S-48	41,027	41,051	24	RR TOE WALL	NO-ACTION	1/4-ton RR lining toe of bank; good condition; Site should be stabilized as part of recommended Canyon Rd Bridge fish ladder replacement project

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	A-36	41,019	41,027	8	CLASS A	NO-ACTION	Recent minor bank erosion along toe of bank; Relatively protected ch position between u/s and d/s stabilization structures; dense clay exposed in toe of bank; no structures or mature trees appear threatened; Site should be stabilized as part of recommended Canyon Rd Bridge fish ladder replacement project
SA CK RB	S-47	41,009	41,019	10	SACKRETE U/S WINGWALL	NO-ACTION	Stable; good condition; u/s end likely to be outflanked by u/s oversteepened bank instability; Site should be stabilized as part of recommended Canyon Rd Bridge fish ladder replacement project
SA CK RB	S-46	41,009	40,989	20	CULVERT	ACTION	Canyon Rd bdge culvert; 28 ft-wide by 10 ft-wide reinforced conc rectangular culvert with conc bottom and existing denil-type fish ladder; barrier to fish migration; does not appear to be a flood constriction
SA CK RB	S-45	40,989	40,951	38	VERT TIMBER RET WALL	NO-ACTION	Vert timber ret wall at high bank condition +/- 40 ft above OHW; Appears stable and in good condition
SA CK RB	S-44	40,951	40,941	10	RR BANK	NO-ACTION	Grouted; Stable; good condition
SA CK RB	S-43	40,941	40,901	40	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall in completely failed overturned condition; Stable in overturned position; Failed wall appears to have no negative effects on d/s bank stability or riparian canopy cover, provides stability to d/s RB site
SA CK RB	A-35	40,901	40,880	21	CLASS A	NO-ACTION	Relatively stable, protected ch position, well-vegetated
SA CK RB	B*-20	40,880	40,653	226	CLASS B*	NO-ACTION	Difficult site; Chronic mid-bank erosion in large actively eroding and downslope moving landslide body; not feasible to stabilize large active landslide body; bedrock exposed in toe of bank
SA CK RB	B*-19	40,653	40,567	87	CLASS B*	NO-ACTION	Difficult site; Recent and continuing sediment contributions from RB tributary stream cutting through active landslide body or debris flow deposit; Major active sediment source for upper San Anselmo Ck but appears infeasible to stabilize; Construction equipment access very limited; Stabilization is geotechnically challenging; Colluvium exposed in toe of bank
SA CK RB	S-42	40,567	40,499	68	RR BANK	NO-ACTION	RR bank protecting headwall of 12-17 ft-high RB fine-grained, erodible alluvial terrace deposit

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B*-18	40,499	40,342	157	CLASS B*	ACTION	Difficult site; 12-17 ft-high nr-vert and actively bank of fine-grained alluvial terrace; Surface of terrace appears undeveloped with few trees but some unimproved road access; Existing canopy cover very limited in this reach; Most recent major bank erosion at site induced by failure of LB vert conc ret wall and encroached LB RR bank stabilization structure; Few mature TOB trees and no structures appear threatened; Site stabilization would probably achieve sediment source site reduction and canopy cover restoration objectives only; Recommend laying back bank and placing vegetated geofabric, with dense live willow pole plantings or live willow wall along toe of bank; Also recommend additional erosion protection along toe of bank up to WSE + 4 ft, including cabled RR-LWD rootwad structures placed at carefully selected locations along the toe of bank to deflect erosion pressure from LB failed wall and LB encroached RR bank structures and induce gr bar deposition along finished toe of bank; Note: recommended canopy enhancement site
SA CK RB	A-34	40,342	40,259	84	CLASS A	NO-ACTION	Stable position; well treed; medium dense clay toe; clay outcrop in bed downstream 15 ft
SA CK RB	C-5	40,259	40,228	31	CLASS C	NO-ACTION	Existing oak trees at top of 14 ft-high eroding bank, access to site appears very limited
SA CK RB	B*-17	40,228	40,088	140	CLASS B*	NO-ACTION	Med density clay toe; narrow bnf ch width; no threatened structures; mult immature native trees lost by construction or no-action; access appears very poor; no canopy improvement potential at site
SA CK RB	A-33	40,088	39,885	202	CLASS A	NO-ACTION	Stable inside bend ch position with well-developed fp bench d/s from deep clay outcrop in bank; Recent minor bank erosion along reach in loose colluvial bank material prone to shallow slumps; Bank erosion does not threaten existing mature riparian trees or structures; Existing canopy cover excellent in reach
SA CK RB	BR-19	39,885	39,836	49	BR BANK/OC	NO-ACTION	Stable bedrock bank
SA CK RB	B*-16	39,836	39,645	191	CLASS B*	NO-ACTION	Bank is nr-vert and rapidly eroding in places along site; Numerous mature TOB trees threatened by undermining and bank failures, and at least one recent tree eroded into ch Dec-31-05; Construction access appears very poor; Mature mid-bank and TOB trees lost to site stabilization or no-action; Existing canopy cover excellent in reach and will remain largely intact if site is not stabilized; SA Ck RB is cut in toe of canyon wall along site, including partial sections of sidecast fill from early construction of unimproved private road high on bank
SA CK RB	S-41	39,645	39,609	37	LOG RET WALL	NO-ACTION	Redwood logs placed as ret wall up to WSE + 3-3.5 ft; Failing, but self-stabilized condition
SA CK RB	S-40	39,609	39,585	24	RR TOE WALL	NO-ACTION	RR bank appears dump-placed from unimproved road at TOB

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B*-15	39,585	39,465	120	CLASS B*	ACTION	Very difficult site; Nr-vert approx. 13-14 ft-high relatively rapidly eroding bank at very unstable outside bend ch position where flood flows directly attack exposed bank; no mature TOB trees or structures; Construction access appears excellent from TOB; Dense gr alluvium and bedrock exposed in toe of bank arrests erosion rate; Overlying fine-grained sediment in very unstable nr-vert condition with recent shallow slope failures; Very wide ch reach at site due to progressive bank retreat at RB; Existing canopy cover is poor at site as limited by long-term progressive bank erosion at RB; Wide gr bar and fp bench formed at LB; Stabilizing site would achieve sediment source site reduction and canopy enhancement objectives; Recommend stabilizing site by laying back bank from WSE + 5 ft to TOB at max 1.5(H):1(V) slope and placing vegetated, drip-irrigated geofabric; Also recommend deflecting erosion pressure off toe of bank below WSE + 5 ft by installing cable-anchored 1-ton RR and LWD structure within existing ch; Existing ch width can accommodate approx. 6 horiz ft of encroachment w/o habitat impacts; Structure should be care- fully designed to prevent deflecting flood erosion pressure from d/s LB vert conc ret wall to next d/s LB site; Structure should also be designed to include backfill with clean, washed gr to allow planting with native alder 1-gal container plants and live willow poles, and accommodate scour pool formation along toe of structure. Note: recommended canopy enhancement site
SA CK RB	A-32	39,465	39,348	117	CLASS A	NO-ACTION	Stable inside bend ch position; Gradually sloped bank with dense vegetation.
SA CK RB	S-39	39,348	39,307	41	RR APRON	NO-ACTION	Grouted, undercut, and prone to failure; Probably failure mode is self-stabilizing; Very narrow ch reach position created by structure encroachment at both LB and RB RR apron; Narrow ch cross-section may be local flood flow conveyance constraint, but not overbank flows not likely in this reach; However, possible that any local SD discharge problems could related to locally elevated flood WSE caused by local narrow ch conditions caused by encroached structures
SA CK RB	A-31	39,307	39,262	45	CLASS A	NO-ACTION	Stable inside bend ch position with dense vegetation
SA CK RB	S-38	39,262	39,240	22	VERT CONC RET WALL	NO-ACTION	Stable; good condition
SA CK RB	S-37	39,240	39,139	101	RR BANK/APRON	NO-ACTION	Grouted; Very narrow approx. 20 ft-wide min ch reach caused by encroachment of stabilization structures
SA CK RB	S-36	39,139	39,098	41	RR BANK	NO-ACTION	Stable; good condition
SA CK RB	S-35	39,098	39,060	39	VERT TIMBER RET WALL	NO-ACTION	Stable; good condition
SA CK RB	B*-14	39,060	38,986	74	CLASS B*	NO-ACTION	16-17 ft-high nr-vert eroding bank at outside bend ch position; Somewhat protected from bank erosion by u/s vert timber ret wall; Construction equipment access appears poor and several mature top of bank trees would be lost to construction or no-action

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	A-30	38,986	38,871	115	CLASS A	NO-ACTION	Stable inside bend ch position; gradual bank slopes with dense vegetation
SA CK RB	S-34	38,871	38,858	13	RR BANK	NO-ACTION	Grouted; u/s extension of Meadow Way Bdge u/s wingwall
SA CK RB	S-33	38,858	38,838	20	VERT CONC RET WALL	NO-ACTION	Meadow Way Bdge u/s wingwall
SA CK RB	S-31	38,838	38,820	18	BDGE	NO-ACTION	Meadow Way bdge crossing; 31 ft-wide by 18+ ft-high timber pier supported timber bridge deck; Does not appear to be a fish passage barrier or a flood constriction
SA CK RB	S-30	38,820	38,780	40	VERT CONC RET WALL	NO-ACTION	L-shaped vert conc ret wall; good condition
SA CK RB	A-29	38,780	38,615	165	CLASS A	NO-ACTION	Stable inside bend ch position; Gradual bank slopes with dense vegetation above bkf WSE; Minor bank erosion and lack of vegetation along toe of bank below bkf WSE
SA CK RB	S-29	38,615	38,491	124	VERT CONC TOE WALL	NO-ACTION	Vert timber ret wall above vert conc toe wall; Good condition
SA CK RB	S-28	38,491	38,407	83	VERT CONC RET WALL	NO-ACTION	Good condition
SA CK RB	B*-13	38,407	38,383	24	CLASS B*	ACTION	Recent bank failure and tree throw in very unstable approx. 1(H):1(V) or steeper sloped approx. 20 ft-high bank immediately d/s from RB vert conc ret wall; Failure apparently caused by high velocity flows focused along relatively smooth vert conc ret walls u/s; Medium density clay exposed in toe of bank below failure; RR bank failure created self-stabilized apron of RR pieces within toe of failure deposit; Existing canopy cover good in this reach and canopy enhancement potential of project is limited or negligible; No structures or mature riparian trees threatened by additional bank erosion at site; Failure is somewhat self-stabilized in place, but failure deposit encroached approx. 15 horiz ft into channel bed and now deflects erosion pressure toward vulnerable site d/s at LB; Construction equipment access looks difficult but feasible, particularly with "long-reach" type excavator or benching down with smaller excavator from unimproved road high on bank; Recommend removing RR pieces and fine-grained material from failure deposit to reconstruct approx. pre-failure bank profile with MSE soil lifts and place vegetated geofabric erosion control on finished surface; place RR pieces along toe of bank up to WSE + 9 ft at the u/s end of the site immediately d/s from the d/s end of the u/s RB vert conc ret wall, and along toe of bank along entire site to deflect erosion pressure toward ch C/L without increasing erosion pressure at d/s LB sites; Also recommend considering incorporating cabled LWD rootwad into RR bank structure to encourage scour pool formation at toe of RR bank with overhead cover provided by rootwad; Also recommend careful design and construction of RR bank to project slightly into the flow path in the u/s end of the site in order to encourage natural self-sustaining gr bar deposit along toe of bank at the d/s end of the site

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SA CK RB	A-28	38,383	38,362	21	CLASS A	NO-ACTION	Stable ch position somewhat protected by upstream slump failure deposit; Existing RR pieces form partial apron along toe of bank at site
SA CK RB	BR-18	38,362	38,236	126	BR BANK	NO-ACTION	Stable bedrock bank
SA CK RB	A-27	38,236	38,164	71	CLASS A	NO-ACTION	Stable inside bend ch position with fp bench d/s from stable BR bank; Shallow bedrock below toe of bank; Dense vegetation and fine sed dep on fp bench
SA CK RB	BR-17	38,164	38,156	8	BR BANK/OC	NO-ACTION	Stable bedrock bank
SA CK RB	A-26	38,156	38,085	71	CLASS A	NO-ACTION	Relatively stable ch position; Shallow bedrock below toe of bank; Relatively dense vegetation; Some minor bank erosion in gr alluvium and clayey-silty-sand fp dep material exposed in bank below bkf depth
SA CK RB	BR-16	38,085	38,065	20	BR BANK/OC	NO-ACTION	Stable bedrock bank
SA CK RB	A-25	38,065	38,026	39	CLASS A	NO-ACTION	Relatively stable ch position; Shallow bedrock below toe of bank; Relatively dense vegetation; Some minor bank erosion in gr alluvium and clayey-silty-sand fp dep material exposed in bank below bkf depth
SA CK RB	C-4	38,026	38,011	15	CLASS C	NO-ACTION	Clump of mature mid-bank and TOB riparian trees threatened by chronic minor lower and mid-bank erosion; Bank erosion appears slow and self-stabilizing but trees likely to erode into channel; Construction equipment access appears very limited due to steepness of bank and density of existing vegetation from WSE up to high bank unimproved road access; Unimproved road at high bank may be MMWD water pipeline ROW; Mature TOB trees lost if site is stabilized or if no-action
SA CK RB	A-24	38,011	37,951	60	CLASS A	NO-ACTION	Relatively stable ch position; Shallow bedrock below toe of bank; Relatively dense vegetation; Some minor bank erosion below bkf depth
SA CK RB	BR-15	37,951	37,868	82	BR BANK/OC	NO-ACTION	Stable bedrock bank
SA CK RB	A-23	37,868	37,795	73	CLASS A	NO-ACTION	Relatively stable ch position; Shallow bedrock below toe of bank; Relatively dense vegetation; Some minor bank erosion below bkf depth
SA CK RB	BR-14	37,795	37,754	41	BR BANK/OC	NO-ACTION	Stable bedrock bank

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SA CK RB	B-19	37,754	37,729	25	CLASS B	NO-ACTION	Numerous mature mid-bank and TOB trees threatened by frequent minor lower and mid-bank erosion; Bank erosion appears slow and self-stabilizing but trees likely to erode into channel; San Anselmo Ck cuts against RB canyon wall in this reach; Construction equipment access appears somewhat limited due to steepness of bank up to high bank unimproved road access but may be accessible with "long reach" type excavation equipment from unimproved road surface; Unimproved road at high bank may be MMWD water pipeline ROW; Bank erosion in this reach will ultimately threaten utilities infrastructure within the unimproved road prism; Mature TOB trees lost if site is stabilized or if no-action due to steepness of site; May be possible to install cabled RR-LWD structures at selected locations where stable bedrock banks are exposed along toe of bank along reach to deflect erosion pressure from lower and mid-bank and encourage gr bar deposition and willow and alder establishment along toe of bank
SA CK RB	BR-13	37,729	37,701	27	BR BANK/OC	NO-ACTION	Stable bedrock bank
SA CK RB	B-18	37,701	37,670	31	CLASS B	NO-ACTION	Numerous mature mid-bank and TOB trees threatened by frequent minor lower and mid-bank erosion; Bank erosion appears slow and self-stabilizing but trees likely to erode into channel; San Anselmo Ck cuts against RB canyon wall in this reach; Construction equipment access appears somewhat limited due to steepness of bank up to high bank unimproved road access but may be accessible with "long reach" type excavation equipment from unimproved road surface; Unimproved road at high bank may be MMWD water pipeline ROW; Bank erosion in this reach will ultimately threaten utilities infrastructure within the unimproved road prism; Mature TOB trees lost if site is stabilized or if no-action due to steepness of site; May be possible to install cabled RR-LWD structures at selected locations where stable bedrock banks are exposed along toe of bank along reach to deflect erosion pressure from lower and mid-bank and encourage gr bar deposition and willow and alder establishment along toe of bank
SA CK RB	BR-12	37,670	37,584	86	BR BANK/OC	NO-ACTION	Stable bedrock bank
SA CK RB	A-22	37,584	37,562	22	CLASS A	NO-ACTION	Relatively stable ch position; Shallow bedrock below toe of bank; Relatively dense vegetation; Some minor bank erosion below bkf depth
SA CK RB	BR-11	37,562	37,526	36	BR BANK/OC	NO-ACTION	Stable bedrock bank

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SA CK RB	B-17	37,526	37,448	77	CLASS B	NO-ACTION	Numerous mature mid-bank and TOB trees threatened by frequent minor lower and mid-bank erosion; Bank erosion appears slow and self-stabilizing but trees likely to erode into channel; San Anselmo Ck cuts against RB canyon wall in this reach; Construction equipment access appears somewhat limited due to steepness of bank up to high bank unimproved road access but may be accessible with "long reach" type excavation equipment from unimproved road surface; Unimproved road at high bank may be MMWD water pipeline ROW; Bank erosion in this reach will ultimately threaten utilities infrastructure within the unimproved road prism; Mature TOB trees lost if site is stabilized or if no-action due to steepness of site; May be possible to install cabled RR-LWD structures at selected locations where stable bedrock banks are exposed along toe of bank along reach to deflect erosion pressure from lower and mid-bank and encourage gr bar deposition and willow and alder establishment along toe of bank
SA CK RB	A-21	37,448	37,167	281	CLASS A	NO-ACTION	Stable inside bend ch position, with gr bars and fp bench and fine sed dep; very wide ch reach for SA Ck; Appears wide reach is result of significant cumulative long term LB erosion
SA CK RB	A-20	37,167	37,016	151	CLASS A	NO-ACTION	Stable inside bend ch position with gr bars and fp sed; Channel becomes typically narrow within site compared to u/s wide reach; Some minor bank erosion along toe of bank
SA CK RB	S-27	37,016	36,998	18	RR TOE WALL	NO-ACTION	Good condition
SA CK RB	A-19	36,998	36,954	44	CLASS A	NO-ACTION	Relatively stable ch position with some minor bank erosion along toe of bank; LB floodplain partially dissipates flood energy above bkf WSE
SA CK RB	S-26	36,954	36,946	8	RR TOE WALL	NO-ACTION	Good condition; facing class rock
SA CK RB	BR-10	36,946	36,923	23	COLL BLDR	NO-ACTION	Approx. 20 ft-diameter bldr forms right bank; bldr appears derived from massive turn-of-the-century (ca. 1900) or pre-historical RB canyon wall landslide
SA CK RB	S-25	36,923	36,829	93	GABION WALL	NO-ACTION	1(H):1(V) sloped gabion wall with massive 18 in-diam conc pier vert timber ret wall above gabion wall, and 1(H):1(V) sloped RSP above ret wall; Canopy cover very limited in reach by massive bank stabilization structure for construction of condominiums on steep landslide deposit above ck; Difficult to vegetate structure, including upper bank above RSP

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B*-12	36,829	36,790	39	CLASS B*	ACTION	Recent 19-20 ft-high bank slump failure and tree throw immediately downstream from gabion and vert timber ret wall; Failure evidently resulted from high velocity flows focused along RB edge of u/s unvegetated gabion and vert timber ret wall structures; Site appeared to have been unstable and possible stabilized with RR prior to failure; Shallow BR below toe of bank; RR derived from bank failure created self-stabilized apron of RR pieces and fine sediment that encroaches approx. 10 horiz ft into ch; Additional failures likely in fine-grained mid- and upper bank material (appears former landslide deposit); No structures or mature riparian trees appear threatened by additional erosion; Encroachment of failure deposit deflects erosion pressure to vulnerable LB sites d/s; Construction equipment access looks difficult but feasible, particularly with "long-reach" type excavator or benching down with smaller excavator from unimproved road high on bank; Recommend removing RR pieces and fine-grained material from failure deposit to reconstruct approx. pre-failure bank profile with MSE soil lifts and place vegetated geofabric erosion control on finished surface; place RR pieces along toe of bank up to WSE + 9 ft at the u/s end of the site immediately d/s from the d/s end of the u/s RB vert conc ret wall, and along toe of bank along entire site to deflect erosion pressure toward ch C/L without increasing erosion pressure at d/s LB sites; Also recommend considering incorporating cabled LWD rootwad into RR bank structure to encourage scour pool formation at toe of RR bank with overhead cover provided by rootwad; Also recommend careful design and construction of RR bank to project slightly into the flow path in the u/s end of the site in order to encourage natural self-sustaining gr bar deposit along toe of bank at the d/s end of the site;
SA CK RB	B-16	36,790	36,749	41	CLASS B	NO-ACTION	Recent mid-bank erosion and upper bank erosion threatens several mature trees near TOB; Due to steepness of site, trees will be lost to site stabilization construction or no-action; Recommended stabilization of imm u/s RB site will improve stability of site; Shallow BR below toe of bank;
SA CK RB	BR-9	36,749	36,730	19	BR BANK/OC	NO-ACTION	Stable bedrock bank
SA CK RB	B-15	36,730	36,615	115	CLASS B	NO-ACTION	Recent mid-bank erosion and upper bank erosion; Due to steepness of site, TOB trees will be lost to site stabilization construction or no-action; Shallow BR below toe of bank; May be possible to install cabled RR-LWD structure along toe of bank at imm u/s BR bank site to deflect erosion pressure from lower and mid-bank and encourage gr bar deposition and willow and alder establishment along toe of bank
SA CK RB	S-24	36,615	36,575	40	GABION WALL	NO-ACTION	Gabion wall

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/ Structure Class	Recommend Action/ No-Action	Site/Structure Description
SA CK RB	B-14	36,575	36,565	10	CLASS B	NO-ACTION	Recent mid-bank erosion and upper bank erosion; Due to steepness of site, TOB trees will be lost to site stabilization construction or no-action; Shallow BR below toe of bank; May be possible to install cabled RR-LWD structure along toe of bank at d/s end of imm u/s gabion wall site to deflect erosion pressure from lower and mid-bank and encourage gr bar deposition and willow and alder establishment along toe of bank
SA CK RB	S-23	36,565	36,348	217	RR BANK	NO-ACTION	RR bank along bank of 7-10 ft-high RB floodplain unit with residential development
SA CK RB	BR-8	36,348	36,338	10	BR BANK/OC	NO-ACTION	Stable bedrock bank
SA CK RB	C-3	36,338	36,332	6	CLASS C	ACTION	Facing class RR bank protection at outside ch bend position eroded out from under existing native maple tree at approx. WSE + 12 ft; Site vulnerable to continuing erosion and tree-throw; Recommend replace RR bank with vegetated 1/4-ton min RR bank; Also recommend hand-work to place geofabric and live willow poles at recently eroded LB site d/s
SA CK RB	S-22	36,332	36,264	67	RR BANK	NO-ACTION	Good condition
SA CK RB	A-18	36,264	36,200	64	CLASS A	NO-ACTION	Relatively stable, well-vegetated
SA CK RB	S-21	36,200	36,141	59	RR BANK	NO-ACTION	Good condition
SA CK RB	A-17	36,141	36,048	92	CLASS A	NO-ACTION	Relatively stable, well-vegetated
SA CK RB	BR-7	36,048	36,013	35	BR BANK/OC	NO-ACTION	Stable bedrock bank
SA CK RB	B-13	36,013	35,994	19	CLASS B	NO-ACTION	Recent minor lower and mid-bank erosion; No structures or mature TOB trees appear threatened; Existing canopy cover excellent in reach; low-med density clay exposed in toe of bank up to WSE +1 ft; Stabilizing site would achieve sediment source site reduction objective only
SA CK RB	A-16	35,994	35,962	32	TRIB CONF	NO-ACTION	Wood Lane Creek tributary confluence; Severely undercut alder at trib conf appears stable; Recommend cutting alder and converting to permanent LWD debris jam as bank erosion protection for site by cable-anchoring existing root ball in place to pieces of 1/2-ton RR and other LWD rootwads placed along toe of bank;
SA CK RB	B-12	35,962	35,936	26	CLASS B	NO-ACTION	Difficult site; Frequent minor lower and mid-bank erosion and very poor vegetation cover along bank at site; No structures appear threatened; Existing mature TOB trees would be lost to site stabilization or no-action; Note: several mature TOB trees threatened by ongoing minor bank erosion in reach; Tree throw into ch would likely destabilize vulnerable LB sites d/s or possibly contribute to debris jam at d/s Bolinas-Fairfax Rd bdge culvert

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B-11	35,936	35,868	67	CLASS B	NO-ACTION	Difficult site; Frequent minor mid-bank erosion and lack of vegetation cover on bank but existing mature alder tree roots stabilize gr bar at toe of bank along site; No structures appear threatened by imm future continuing bank erosion; Mature TOB trees would be lost to site stabilization or construction or no-action; Narrow ch reach; Note: several mature TOB trees threatened by ongoing minor bank erosion in reach; Tree throw into ch would likely destabilize vulnerable LB sites d/s or possibly contribute to debris jam at d/s Bolinas-Fairfax Rd bdge culvert
SA CK RB	C-2	35,868	35,835	33	CLASS C	NO-ACTION	Difficult site; Narrow ch reach caused by approx. 10 horiz ft encroachment into ch by existing LB RR bank site; Mature alder tree at TOB likely to erode into ch; Bank erosion at site appears exacerbated by encroachment of LB RR bank structure; Appears difficult to stabilize tree at site due to limited ch width prohibiting construction of a stable RR bank structure; Recommend cutting alder tree and cable-anchoring tree pieces to RR placed along LB existing RR bank sites to improve aquatic habitat and encourage gr bar deposition along toe of LB; Note: this is one of several mature TOB trees threatened by ongoing minor bank erosion in reach; Tree throw into ch would likely destabilize vulnerable LB sites d/s or possibly contribute to debris jam at d/s Bolinas-Fairfax Rd bdge culvert
SA CK RB	A-15	35,835	35,624	211	CLASS A	NO-ACTION	Existing mature alder tree roots reinforce toe of bank;
SA CK RB	S-20	35,624	35,587	37	CULVERT	NO-ACTION	Bolinas-Fairfax Rd bdge crossing; 18 ft-wide by 13 ft-high reinforced conc rect culvert with conc bottom (at grade); Effective ht of opening is approx 10-11 ft due to hanging sewer pipe
SA CK RB	B*-11	35,587	35,476	111	CLASS B*	ACTION	Chronic bank erosion and completely failed vert conc ret wall overturned into ch at u/s end of outside bend ch position; Failed wall appears somewhat self-stabilized and may be a relatively good fish habitat as is; Likely continuing mid-bank and upper bank erosion behind failed wall appears to threaten an existing TOB residential outbuilding structure; Actual threat to existing structure or priority to save existing structure as is unknown and requires additional geotechnical analysis; May be possible to stabilize existing TOB structure using pour in-place conc or other type of driven pier extending down to dense gr alluvium or BR below dense alluvium; May also be possible to protect existing oversteepened upper bank using cable-anchored RR and LWD structure designed to deflect high flow energy off bank; Existing ch width and LB fp bench can accommodate encroachment into ch by failed wall and proposed cable-anchored RR-LWD structure and partially dissipates high flow energy and erosion pressure in reach
SA CK RB	S-19	35,476	35,450	26	VERT CONC RET WALL	NO-ACTION	Intact section of vert conc ret wall

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B*-10	35,450	35,429	21	CLASS B*	ACTION	Completely failed section of vert conc ret wall; Existing bank behind wall sloped approx. 1.5(H):1(V); Recommend stabilization and plantings to reduce bank erosion potential and improve native riparian tree canopy cover and near shore vegetation cover by removing or deconstructing failed wall pieces in place, and stabilizing raw bank behind wall with 1.5(H):1(V) vegetated geofabric erosion control planted bank; Also recommend constructing live willow pole vegetated 1/4-ton min RR toe wall along toe of finished bank at max 1(H):1(V) finished slope
SA CK RB	S-18	35,429	35,389	40	VERT TIMBER RET WALL	NO-ACTION	Good condition; Conc piers; Existing gr bar at toe of structure forced by u/s vert conc ret wall failure
SA CK RB	A-14	35,389	35,254	136	CLASS A	NO-ACTION	Stable, inside bend ch position; Existing point gr bar at toe of bank through site; Fine sed dep on gr bar at d/s end of site
SA CK RB	S-17	35,254	35,220	33	VERT TIMBER RET WALL	NO-ACTION	Currently in relatively stable, overall good condition, but does not appear to have subgrade footing; Existing gr bar at toe of structure; Wall structure may be prone to failure by undermining if existing gr bar at toe were to change shape or position in ch due to low-flow ch shifting caused by LWD debris failure into ch; bank failure deposit into channel, or encroachment into ch by new stabilization structure in the vicinity of the site; However, current low-flow ch planform appears fixed by u/s ch bend
SA CK RB	B-10	35,220	35,199	21	CLASS B	NO-ACTION	Difficult site; Recent lower and mid-bank erosion on approx. 14 f-high 1(H):3.5(V) sloped bank; One mature bay tree and fence threatened at TOB; No other structures appear threatened; Loss of TOB trees would have negligible impact on good canopy cover in reach; TOB trees would be lost by site stabilization or no-action; May be possible to stabilize bank and save TOB trees and fence by constructing vegetated 1/4-ton min RR bank at max 1(H):2(V) slope up to WSE + 9 ft, requiring min 4 horiz ft encroachment into ch; Existing ch width in reach appears nearly adequate to accommodate 4 horiz ft encroachment; Encroached RR bank at site would likely contribute to gr bar dep along toe of bank at d/s Class B site, but not necessarily the d/s Class B* site
SA CK RB	S-16	35,199	35,171	28	RR TOE WALL	NO-ACTION	Fair to good condition
SA CK RB	B-9	35,171	35,141	30	CLASS B	NO-ACTION	Approx. 16-17 ft-high 1(H):1.75(V) sloped bank up to fence at TOB; No mature vegetation or structures appear threatened; Site stabilization would achieve sediment source site reduction objective only
SA CK RB	S-15	35,141	35,119	22	RR BANK	NO-ACTION	Fair to good condition

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B*-9	35,119	35,086	33	CLASS B*	ACTION	Recent and continuing lower and mid-bank erosion on approx. 18 ft-high 1(H):2.75(V) to 1(H):3.5(V) sloped bank; Recommend constructing live willow pole vegetated mixed 1/4- to 1/2-ton RR bank at max 1(H):2(V) finished slope tied into existing vert conc ret wall imm d/s from site; Construction of recommended RR bank would require min 5 horiz ft encroachment into ch; Also recommend cabling LWD rootwad in joint between finished recommended RR bank and d/s existing vert conc ret wall to promote stable scour pool formation with permanent vegetative cover at outside bend ch position
SA CK RB	S-14	35,086	35,067	18	VERT CONC RET WALL	ACTION	Existing 5 ft-high vert conc ret wall is partially overturned into ch; Recent minor bank erosion above wall from recent high flows; Existing riparian tree canopy cover very limited in reach; Recommend placing vegetated geofabric erosion control on raw bank above wall to reduce bank erosion and improve riparian tree canopy cover
SA CK RB	S-13	35,067	35,021	46	RR TOE WALL	NO-ACTION	Grouted, 4.5 ft-high RR toe wall in fair-good condition
SA CK RB	S-12	35,021	34,970	51	VERT CONC RET WALL	NO-ACTION	Approx. 4-6 ft-high (var.) vert conc ret wall in good condition; Existing structure includes fully grouted apron spanning entire ch bed width from RB structure to LB bedrock bank outcrop
SA CK RB	S-11	34,970	34,898	72	VERT CONC RET WALL	NO-ACTION	Approx. 12-13 ft-high vert conc ret wall in good condition
SA CK RB	B-8	34,898	34,621	277	CLASS B	NO-ACTION	Recent minor bank erosion along toe of approx. 1(H):1(V) sloped bank at inside bend ch position; Bank erosion primarily below bkf depth; Numerous completely failed poorly-designed toe protection structures along site; Existing bank materials dominated by random fill, probably placed during original construction of Creek Rd housing; Site is chronic minor sediment source; Ch reach is narrower than recommended design min bkf width, apparently caused by encroachment into ch by LB stabilization structures and historical placement of random fill in ck along LB site; No mature trees or structures appear imm threatened by continuing bank erosion, but numerous partially undermined mid-bank trees ultimately will erode into ck; Site is candidate for reach-scale inside bend bank restoration to reduce bank erosion and promote long-term native riparian canopy establishment by planting native alder 1-gal container plants at stabilized locations along finished toe of bank; Low priority site
SA CK RB	S-10	34,621	34,557	64	BDGE	NO-ACTION	Creek Rd bdge crossing; 67 ft-wide (effective width approx. 50-55 ft accounting for approx. 30-35 deg skew) pier supported conc bdge deck; appears neither a fish passage barrier nor a flood constriction

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	A-13	34,557	34,415	142	CLASS A	NO-ACTION	Relatively stable straight ch position d/s from Creek Rd bdge; Recent bank erosion below bkf depth exposes medium density clay along toe of approx. 25 ft-high bank imm d/s from Creek Rd bdge; Oversteepened upper bank material imm d/s from Creek Rd bdge appears composed of mixed native fine-grained sediment and random fill and dominated by non-native ground cover; Existing riparian tree canopy cover good-exc in reach
SA CK RB	A-12	34,415	34,395	20	TRIB CONF	NO-ACTION	Deer Park Creek confluence at d/s end of RB fp bench and imm u/s from SA Ck bedrock bank; Bedrock exposed in bed of Deer Park Creek; Stable site
SA CK RB	BR-6	34,395	34,274	122	CLASS B	NO-ACTION	Difficult site; Bedrock exposed on bank up to WSE + 6-10 ft (var.) along site; Fine-grained A horizon sediment (may be landslide deposit) overlying bedrock bank is oversteepened and very unstable between WSE + 6-10 ft (var.) and TOB at approx. WSE + 20-22 ft (var.); A few mature native riparian TOB trees do not appear feasible to save due to steepness and ht of bank; Existing canopy cover is good in reach and would be negligibly impacted by loss of TOB trees; No structures appear threatened nr TOB but need to confirm from TOB; Site stabilization would require laying back from top of bedrock to TOB and removal of TOB trees; Appears site stabilization would achieve sediment source site reduction objective only
SA CK RB	A-11	34,274	34,223	50	CLASS A	NO-ACTION	Relatively stable section of bank with vegetative cover
SA CK RB	B*-8	34,223	34,205	18	CLASS B*	NO-ACTION	Difficult site; Approx. 17 ft-high 1(H):4.5(V) sloped bank prone to bank slump failure; Clayey alluvium not exposed in toe of bank; Entire bank appears composed of fine-grained A horizon sediment (may be landslide deposit); Mature TOB trees threatened, but no structures; Existing gr bar along toe of bank but gr bar will disappear if imm d/s undermined tree (Class C site) fails; Site stabilization would require laying back bank and losing TOB trees, constructing vertical wall along existing toe of bank, or constructing 10 ft-high steeply sloped 1(H):2(V) RR bank encroached into ch min 4-5 horiz ft
SA CK RB	C-1	34,205	34,180	25	CLASS C	NO-ACTION	Severely undercut tree, but substantial root anchoring into bank remains; Does not appear tree will fail immediately; Difficult to stabilize w/o filling ch beneath undercut tree roots with heavy RR
SA CK RB	B-7	34,180	34,168	12	CLASS B	NO-ACTION	Recent bank erosion along 8 ft-high bank; Site stabilization would achieve sediment source reduction objective only
SA CK RB	A-10	34,168	34,103	65	CLASS A	NO-ACTION	Stable inside bend ch position; Existing alder roots stabilize toe of bank along site
SA CK RB	S-9	34,103	34,057	45	RR BANK	NO-ACTION	RR bank up to WSE + 10 ft; fair-good condition
SA CK RB	BR-5	34,057	33,988	69	BR BANK/OC	NO-ACTION	Stable bedrock bank

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B-6	33,988	33,945	43	CLASS B	NO-ACTION	Frequent minor bank erosion below bnf depth exposes clay in toe of bank along site; No mature trees or structures appear threatened; Erosion appears self-stabilizing; Site stabilization would achieve sediment source site reduction objective only; May be possible to lay back toe and top of bank to increase the ch width to more than the recommended design bnf ch width, and then install cabled RR-LWD rootwad structure(s) along finished toe of bank to encourage gr bar deposition along toe of bank imm d/s from structures and allow for establishment of native willow and alders to stabilize gr bar along toe
SA CK RB	S-8	33,945	33,870	74	VERT TIMBER RET WALL	NO-ACTION	Upstream end of approx. 13 ft-high vert timber ret wall at outside bend ch position is failing; Existing RR toe wall is foundation below timber ret wall; Recommend existing RR toe wall remain in place for possible repair; Difficult to assess bank conditions behind failed wall to formulate site-specific repair recommendations for site
SA CK RB	A-9	33,870	33,777	94	CLASS A	NO-ACTION	Stable inside bend ch position with existing alder roots stabilizing toe of bank
SA CK RB	S-7	33,777	33,681	96	VERT TIMBER RET WALL	NO-ACTION	Timber and concrete retaining wall with grouted RR toe apron structure; Downstream section of wall completely failed and overturned into ch; Existing wall backfill is broken conc rubble; Appears self-stabilized
SA CK RB	A-8	33,681	33,617	64	CLASS A	NO-ACTION	Stable ch position imm d/s from partially failed RB vert timber ret wall; Existing alder tree roots stabilize toe of bank along site
SA CK RB	BR-4	33,617	33,598	19	BR BANK/OC	NO-ACTION	Stable bedrock bank
SA CK RB	B*-7	33,598	33,562	35	CLASS B*	NO-ACTION	Slope failure in near-vertical 15-ft-high A horizon materials overlying BR BANK/OC in toe; immediately d/s from footbridge; non-native groundcover vegetation and shed at top of bank threatened; repair appears difficult due to ht and slope and residential property at top of bank
SA CK RB	BR-3	33,562	33,546	16	BR BANK/OC	NO-ACTION	Stable bedrock bank
SA CK RB	A-7	33,546	33,486	60	CLASS A	NO-ACTION	Relatively stable ch position between exposed bedrock bank sites; Existing alder tree roots stabilize toe of bank
SA CK RB	BR-2	33,486	33,476	10	COLL BLDR	NO-ACTION	RB formed by approx. 10 ft-diam colluvial bldr evidently lag from landslide deposit; Site appears stable
SA CK RB	A-6	33,476	33,446	30	CLASS A	NO-ACTION	Relatively stable ch position between exposed bedrock bank sites; Existing alder tree roots stabilize toe of bank
SA CK RB	BR-1	33,446	33,378	67	BR BANK/OC	NO-ACTION	Stable bedrock bank

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B-5	33,378	33,311	67	CLASS B	NO-ACTION	Frequent bank erosion on approx. 16 ft-high bank threatens to erode numerous mid- and upper-bank trees (primarily bays) into channel; Unstable fine-grained A horizon sediment material forms upper 10-12 ft of 16 ft-high bank; Bank erosion at site appears partially due to construction of numerous LB bank stabilization structures; No structures appear threatened; Site may be within upstream end of MT&CC property; Existing tree canopy relatively intact in reach but would be significantly reduced if major site-scale bank failure were to occur; Site is within relatively stable ch position due to slight inside bend and influence of flood backwater and fine sediment deposition along toe of bank caused by d/s Pacheco Dam; Site stabilization would require removal of numerous trees
SA CK RB	B-4	33,311	33,180	131	CLASS B	ACTION	Approx. 15 ft-high exposed clayey banks u/s from Pacheco Dam show chronic bank erosion and long-term bank retreat but appear somewhat self-stabilized; Overwidened site may have resulted from historical uses of the pond u/s from Pacheco Dam; Site appears to be within MT&CC property; No mature TOB trees or structures appear threatened; Banks dominated by Rhus throughout site; Existing riparian tree canopy very limited at site; Recommend bank stabilization project to address lack of tree canopy in reach; Adequate ch width at site to allow encroachment into ch as may be necessary to construct bioengineered bank stabilization structure at optimal bank slopes for establishing riparian vegetation; May be possible to construct a 3(H):1(V) sloped bank from MSE soil lifts covered by vegetated geofabric erosion control to establish willows and alders along toe of bank, and mix of bays, ash, and oaks at mid to upper bank
SA CK RB	S-6	33,180	33,174	6	CONC DAM	NO-ACTION	Existing "Pacheco Dam" is abandoned concrete cased sewer pipeline crossing; Intact reinforced concrete casement and d/s concrete apron continues to provide grade control primarily affecting existing condition and stability of u/s sites; Appears that dam removal could be accomplished without significantly compromising bank stability u/s and d/s, but more detailed analysis would be required to confirm and specify necessary treatments; Recommend dam removal be considered only as component of comprehensive reach-scale bank stabilization and channel restoration plan and design needed for the RB MT&CC site, as would also affect multiple d/s LB flood prone private residential properties; Dam is fish barrier when low-flow outlet is jammed with woody debris

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B*-6	33,174	33,000	174	CLASS B*	ACTION	Difficult site; Recent and continuing severe bank erosion along an approx. 12-14 ft-high 1(H):2(V) sloped, poorly vegetated bank with two major recent slope failures and numerous trees recently eroded into ch; Numerous mid-bank and TOB trees threatened by continuing erosion at site; Reach is relatively narrow with bank stabilization structures along entire LB; Recommend laying back bank throughout site to maximum 1.5(H):1(V) slope, providing for minimum 30-32 ft-wide bkf ch width, and placing vegetated geofabric erosion control on finished bank; Also recommend placing cabled RR-LWD rootwad structures along finished toe of bank to encourage deposition of gr bars along toe of bank and allow establishment of alder and willow to stabilize gr bars along toe of bank through site; Recommended treatment would require removal of numerous TOB trees and loss of TOB pvt property; Recommended treatment would temporarily reduce existing canopy cover in reach
SA CK RB	A-5	33,000	32,814	186	CLASS A	ACTION	Relatively stable inside bend ch position; Frequent low- and mid-bank erosion and lack of understory and groundcover vegetation on bank, apparently caused by relatively narrow ch conditions in reach and LB fill and encroachment by multiple poorly designed LB stabilization structures; Numerous mid-bank and upper bank trees will be lost to continuing bank erosion at site; Recommend stabilization project to lay back bank and provide for min 35-40 ft-wide recommended design bkf ch width to allow for natural, self-sustaining gr bar dep at inside bend ch position; Recommended project should be carefully designed to reduce erosion pressure at LB and maximize potential flood management benefits for floodprone LB residential sites; Recommended treatment would require removal of numerous TOB trees and loss of TOB pvt property; Recommended treatment would temporarily reduce existing canopy cover in reach

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B*-5	32,814	32,741	73	CLASS B*	ACTION	Difficult site; Recent and continuing severe bank erosion threatens large mature TOB bay tree threatened at d/s end of site; Bank and TOB tree are difficult to reinforce due to narrow ch conditions exacerbated by encroached LB vert conc ret wall; No TOB structures appear threatened by continuing bank erosion or laying back bank to restore stable conditions; Recommend removing large TOB bay tree to prevent potential damage to LB residential structure if and when tree erodes into ch; Recommended tree removal allows site to be stabilized by laying back bank to max 1.5(H):1(V) stable slope and placing vegetated geofabric erosion control; Medium density clay exposed in toe of bank; RR toe protection may not be required to stabilize finished slope; Recommend laying back toe of bank to provide for min 32 ft-wide recommended design bkf ch width; Existing bay tree roots tbr forces scour pool under existing conditions; Also recommend replacing pool scour function by installation of carefully designed cabled RR-LWD rootwad structure(s) along finished toe of bank; Recommended treatment would require removal of numerous TOB trees and loss of TOB pvt property; Recommended treatment would temporarily reduce existing canopy cover in reach
SA CK RB	B-3	32,741	32,683	58	CLASS B	ACTION	Difficult site; Large mature TOB bay tree anchors d/s end of relatively stable ch segment between two unstable Class B* sites both recommended for major site regrading; Recommend removing large TOB bay tree and treat site same as u/s and d/s sites; Recommended treatment would require removal of numerous TOB trees and loss of TOB pvt property; Recommended treatment would temporarily reduce existing canopy cover in reach
SA CK RB	B*-4	32,683	32,567	116	CLASS B*	ACTION	Difficult site; Nr-vert ch bank at severely eroded outside bend ch position with very focused flood erosion potential exacerbated by alignment of u/s LB vert conc ret wall; TOB trees have long since eroded into channel; No TOB trees at site; Existing tree canopy cover very limited near site as result of long-term outside bend ch erosion and bank retreat; Site is somewhat self-stabilized with dense clay toe and med dense gr alluvium horizon exposed at low- and mid-bank; Continuing bank erosion concentrated at d/s end of bend within site where existing low-, mid- and upper bank tree roots have temporarily checked erosion rate but are prone to immediate failure; Existing TOB house foundation severely undermined and threatened to complete erode into channel; Geometry of eroded bend contributing to erosion of existing d/s LB sackrete structure; Recommend removing existing house and all riparian trees at u/s and d/s ends of site and laying back the bank to max 1:5(H):1(V) stable slope and placing vegetated geofabric erosion control; Managed irrigation required to establish vegetation on finished bank; Existing dense clay exposed in toe of bank may be sufficient to prevent future damaging toe erosion without addition of RR toe protection; d/s end of site limit of grading is 24 in-diam TOB bay tree

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	A-4	32,567	31,839	728	CLASS A	ACTION	Relatively stable straight and inside bend ch position with numerous mid-bank and TOB trees and general lack of understory and groundcover vegetation; Recommend considering project to construct gr bar and fp bench at inside bend ch position to improve habitat and promote establishment of sustainable near-shore riparian and understory vegetation in reach; Recommended project would require laying back the bank and loss of existing mature mid-bank and TOB trees in reach; Recommended project would require loss of exiting TOB pvt property; Recommended project would need to be designed as part of an overall ch restoration and management plan for the MT&CC site, including consideration of possible impacts of fish passage improvement alternatives currently under design development for the d/s Pastori Avenue Bdge crossing
SA CK RB	S-5	31,839	31,824	15	VERT CONC RET WALL	ACTION	Structure in poor ch position; Recommend removing structure as part of possible bank stabilization project for saving historical MT&CC bldg at top of bank, or other future use of MT&CC site, including consideration of possible impacts of fish passage improvement alternatives currently under design development for the d/s Pastori Avenue Bdge crossing
SA CK RB	S-4	31,824	31,816	8	RR BANK	ACTION	Grouted RR bank with conc apron; Structure in poor ch position; Recommend removing structure as part of possible bank stabilization project for saving historical MT&CC bldg at top of bank, or other future use of MT&CC site, including consideration of possible impacts of fish passage improvement alternatives currently under design development for the d/s Pastori Avenue Bdge crossing
SA CK RB	A-3	31,816	31,750	66	CLASS A	ACTION	Relatively stable ch position with numerous low- and mid-bank trees dominated by non-native willow; large failed but self-stabilized conc ret wall at mid-bank; Site treatment depends directly on alternatives under design development for replacement of Pastori Ave fish ladder; Recommend removal of conc wall and non-native trees and bank stabilization at site using vegetated geofabric to establish native alders along finished toe of bank and native alders, bays, ash, and oak at mid- and upper bank.
SA CK RB	S-3	31,750	31,730	20	BDGE	ACTION	Pastori Ave bdge crossing; Approx. 28 ft-wide 10 ft-high reinforced concrete rectangular culvert with conc bottom and existing denil type fish ladder; Existing fish passage barrier; Does not appear to be a flood constriction
SA CK RB	A-2	31,730	31,681	49	CLASS A	NO-ACTION	Excess flood flow capacity in this reach d/s from Pastori Ave bdge; Numerous loose RR pieces scattered along bed and banks within site; Existing mature alder tree roots stabilize toe of bank and narrow RB fp bench surface within site;
SA CK RB	S-2	31,681	31,540	141	RR TOE WALL	NO-ACTION	Fair condition; appears likely to fail during design lifetime of structure given difficult to stabilize slightly outside bend ch position and approx. 25-30 ft-high bank

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B-2	31,540	31,502	38	CLASS B	NO-ACTION	Recent minor low- and mid-bank erosion at unprotected headwall position just u/s from inside bend ch position; Site stabilization would meet sediment source reduction objective only
SA CK RB	B*-3	31,502	31,436	66	CLASS B*	ACTION	Recent mid- and upper bank slope failure in 18 ft-high bank at relatively stable inside bend ch position; No structures appear threatened by continuing erosion at site; No TOB trees at site; Existing riparian tree canopy missing at site but overall good in reach; Recommend project to stabilize bank and restore riparian tree canopy at site; Recommend laying back mid- and upper bank within existing failure area to stable max 1.5(H):1(V) bank slope or less depending TOB pvt property constraints; Stabilize finished slope with vegetated geofabric; Irrigation required to establish vegetation at site; RR toe protection may not be needed at site due to relatively stable inside bend ch position; d/s end of site is stable under existing conditions but partially undermined bay tree at toe of slope; Construction equipment access appears very good from TOB; Also recommend stabilizing existing bay tree as part of project by placing carefully-designed cabled RR-LWD structure beneath tree to promote managed pool scour beneath bay tree and deflect erosion pressure from bank directly beneath tree; Existing ch width adequate in reach to accommodate placement of cabled RR-LWD habitat structure within existing ch; Note: recommended canopy enhancement site
SA CK RB	B-1	31,436	31,345	91	CLASS B	NO-ACTION	Recent mid- and upper bank slope failure in approx. 18 ft-high 1(H):3(V) sloped bank; Failure in loose material dominated by mixed A horizon sediment and random fill; Numerous mature trees form existing tree canopy at TOB; No structures appear threatened by continuing erosion; Difficult to stabilize bank due to steepness and numerous TOB trees that would be lost to regrading; RR toe protection may not be necessary at site due to med dense clay exposed in toe, existing gr bar stabilized along toe of bank by existing alder tree roots, and apparently fixed ch planform alignment in reach
SA CK RB	A-1	31,345	31,124	222	CLASS A	NO-ACTION	Relatively stable bank
SA CK RB	B*-2	31,124	31,011	113	CLASS B*	NO-ACTION	Recent and continuing mid- and upper bank slope failure in approx. 19 ft-high 1(H):2.5(V) sloped bank; Failure in loose material dominated by mixed A horizon sediment and random fill; Numerous mature trees form existing tree canopy at TOB; No structures appear threatened by continuing erosion; Difficult to stabilize bank due to steepness and numerous TOB trees that would be lost to regrading; RR toe protection may not be necessary at site due to med dense clay exposed in toe

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK RB	B*-1	31,011	30,760	251	CLASS B*	NO-ACTION	Difficult site; 35-40 ft-high steep bank composed of colluvial material (may be landslide body) with numerous recent and continuing slope failures; Site very difficult to stabilize due to steep slope, bank height, and numerous TOB trees forming existing tree canopy; No structures appear threatened by continuing erosion; Colluvial boulders form lag deposit on ch bed at site; Coarse bldr lag deposit forms irregular mid-channel and off-channel fp bench dominated by young and mature alders; Site may be natural analog for grade control reaches in fish passage improvement project reaches
SA CK RB	S-1	30,760	30,700	60	VERT TIMBER RET WALL	NO-ACTION	Vert conc pier and timber ret wall in completely undermined and failed condition; Existing condition of wall failure site appears landfill of construction debris; Appears self-stabilized; Existing canopy cover limited in reach and establishment of new riparian vegetation prohibited by landfill debris on bank; Note: recommended canopy enhancement site
SA CK LB	A-50	44,277	44,315	38	CLASS A	NO-ACTION	Relatively stable ch position; Site ends at approx. boundary between Town of Fairfax and MCOSD Cascade Preserve
SA CK LB	S-99	44,055	44,277	222	RR BANK	NO-ACTION	Good condition
SA CK LB	A-49	43,857	44,055	198	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	S-98	43,835	43,857	22	BDGE	NO-ACTION	Pvt driveway bdge crossing; 28.5 ft-wide by 7.7 ft-high clear-span pvt driveway bridge with grouted RR bank and apron and mid-bank vert conc ret wall abutment; does not appear a flood constriction
SA CK LB	S-97	43,822	43,835	13	VERT CONC RET WALL	NO-ACTION	Good condition
SA CK LB	S-96	43,812	43,822	10	VERT CONC TOE WALL	NO-ACTION	Good condition
SA CK LB	S-95	43,791	43,812	21	RR BANK	NO-ACTION	Grouted; Good condition
SA CK LB	A-48	43,678	43,791	113	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	S-94	43,666	43,678	12	RR BANK	NO-ACTION	Good condition
SA CK LB	S-93	43,638	43,666	28	VERT CONC RET WALL	NO-ACTION	Good condition
SA CK LB	S-92	43,597	43,638	41	VERT CONC RET WALL	ACTION	Foundation of vert conc ret wall failing at location of 4 in-diam storm drain outlet; Recommend stabilization of foundation by placement of 1/4-ton RR piece(s); May be possible to also install cabled RR-LWD structure along toe of wall imm u/s from failure designed to encourage gr bar deposition along toe of bank within failure area

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/ Structure Class	Recommend Action/ No-Action	Site/Structure Description
SA CK LB	S-91	43,532	43,597	65	VERT CONC RET WALL	NO-ACTION	Good condition
SA CK LB	S-90	43,392	43,532	140	RR BANK	NO-ACTION	Good condition
SA CK LB	A-47	43,352	43,392	40	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	S-89	43,207	43,352	145	RR BANK	NO-ACTION	Good condition
SA CK LB	A-46	42,789	43,207	418	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	S-88	42,705	42,789	84	RR TOE WALL	NO-ACTION	Good condition
SA CK LB	A-45	42,583	42,705	122	CLASS A	NO-ACTION	Relatively stable ch position; Note: recommend canopy enhancement site
SA CK LB	S-87	42,564	42,583	19	RR BANK	NO-ACTION	Upstream continuation of relatively new RR bank structure through relatively straight ch position heading into outside bend ch position; Note: one LWD rootwad constructed in toe of RR bank forms scour pool along toe of RR bank structure
SA CK LB	S-86	42534	42,564	30	RR BANK	NO-ACTION	Continuation of relatively new RR bank structure; Vert conc ret wall above RR bank up along edge of Cascade Drive ROW
SA CK LB	S-85	42388	42,534	146	RR BANK	NO-ACTION	Relatively new RR bank structure composed of mixed primarily 1/4-ton RR at approx. 1(H):1(V) finished face slope along outside bend ch position; RR bank appears to encroach into ch approx. 6-8 horiz ft in places along site, exacerbating RB toe erosion d/s from site
SA CK LB	B*-16	42,370	42,388	18	CLASS B*	ACTION	Recent bank erosion imm d/s from new RR bank structure appears caused by high velocity flows coming off u/s RR bank; Continuing erosion will likely cause d/s undermined TOB trees to fail into ch; Recommend stabilizing site in conjunction with d/s Class C site by placing cabled RR-LWD structure nr the d/s end of the u/s RR bank designed to deflect high velocity flows away from the LB and toward ch C/L encouraging gr bar deposition along toe of the site and beneath undermined trees at the d/s Class C site
SA CK LB	C-7	42,350	42,370	20	CLASS C	ACTION	Difficult site; Recent bank erosion and severely undermined native riparian trees along outside bend ch position imm d/s from new RR bank; Bank erosion beneath undermined trees appears somewhat self-stabilized; Recommend filling cavity beneath tree with LWD jam cabled together and cabled to 1-2 pieces of 1/2-ton to 1-ton RR placed nr u/s end of site and nr d/s end of u/s RR bank; Cabled LWD-RR structure should be carefully designed to deflect erosion pressure off the LB by partially deflecting high-velocity flows coming off the u/s bank toward the ch C/L and encourage gr bar deposition beneath the undermined tree where willow can establish
SA CK LB	A-44	42,133	42,350	217	CLASS A	NO-ACTION	Stable inside bend ch position d/s from hairpin ch bend

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	S-84	41,975	42,133	158	RR BANK	NO-ACTION	Unvegetated 1/4-ton RR bank up to WSE + 10 ft; Lack of riparian tree canopy cover in reach; Note: recommended canopy enhancement site
SA CK LB	S-83	41,880	41,975	95	RR BANK	NO-ACTION	Unvegetated 1/4-ton RR bank up to WSE + 5 ft; Lack of riparian tree canopy cover in reach; Note: recommended canopy enhancement site
SA CK LB	A-43	41,810	41,880	70	CLASS A	NO-ACTION	Relatively stable straight ch position; med dense gr alluvium exposed in bank
SA CK LB	S-82	41,662	41,810	148	RR TOE WALL	NO-ACTION	RR bank up to approx. WSE + 4 ft along u/s end of LB fp unit
SA CK LB	S-81	41,577	41,662	85	VERT TIMBER RET WALL	NO-ACTION	Approx. 3-4 ft-high vert timber ret wall along u/s end of LB fp unit;
SA CK LB	S-80	41555	41,577	22	VERT TIMBER RET WALL	NO-ACTION	Approx. 3-4 ft-high vert timber ret wall along u/s end of LB fp unit;
SA CK LB	A-42	41,318	41,555	237	CLASS A	NO-ACTION	Relatively stable, straight and slightly inside ch bend position along bank of approx. 6 ft-high LB fp unit with residential development;
SA CK LB	S-79	41,222	41,318	96	RR BANK	NO-ACTION	Approx. 6 ft-high RR bank along d/s end of LB fp unit and heading into 12-13 ft-high bank along outside bend ch position
SA CK LB	B-20	41,192	41,222	30	CLASS B	NO-ACTION	Recent minor low- and mid-bank erosion at outside bend ch position; No TOB mature riparian trees or structures appear threatened by possible continuing erosion;
SA CK LB	A-41	41,060	41,192	131	CLASS A	NO-ACTION	Stable inside bend ch position with fp bench
SA CK LB	S-78	41,019	41,060	41	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall with grouted RR in good condition at slightly outside bend ch position imm u/s from Canyon Road culvert; Residential structure at TOB; Site may need to be stabilized as part of the recommended Canyon Road fish passage improvement project
SA CK LB	S-77	41,007	41,019	13	SACKRETE WALL	NO-ACTION	Nr vert sackrete wall at slightly outside bend ch position imm u/s from Canyon Road culvert; Residential structure at TOB; Site may need to be stabilized as part of the recommended Canyon Road fish passage improvement project
SA CK LB	S-76	41,007	40,989	17	CULVERT	ACTION	Canyon Rd bdge culvert; 28 ft-wide by 10 ft-wide reinforced conc rectangular culvert with conc bottom and existing denil-type fish ladder; barrier to fish migration; does not appear to be a flood constriction
SA CK LB	S-75	40,989	40,939	50	RR BANK	NO-ACTION	RR bank d/s from Creek Rd culvert and upslope from existing denil-type fish ladder; Good condition; Site may need to be stabilized as part of the recommended Canyon Road fish passage improvement project

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/ Structure Class	Recommend Action/ No-Action	Site/Structure Description
SA CK LB	S-74	40,939	40,908	31	RR BANK	NO-ACTION	RR bank composed of large broken concrete rubble; Clay hardpan exposed in ch bed along toe of bank along site; Existing bank toe reinforcement in stable condition; Approx. 25-30 ft-high bank with relatively unstable fine-grained alluvial upper bank materials; Numerous native trees along TOB dominated by redwoods; No structures appear threatened by potential upper bank failure but needs to be confirmed; Site may need to be stabilized as part of the recommended Canyon Road fish passage improvement project
SA CK LB	B-19	40,908	40,866	42	CLASS B	NO-ACTION	Difficult site; Recent and continuing low- and mid-bank erosion along approx. 25-30 ft-high bank resulting in severely oversteepened, nr-vert upper bank composed of unstable fine-grained unconsolidated alluvium; Numerous native trees along TOB dominated by redwoods with roots exposed in oversteepened upper bank; No structures appear threatened by potential upper bank failure but needs to be confirmed; Site may need to be stabilized as part of the recommended Canyon Road fish passage improvement project, although upper bank instability neither result of existing fish ladder structure, nor affected by replacement structure
SA CK LB	A-40	40,866	40,735	132	CLASS A	NO-ACTION	Stable inside bend ch position with LB fp bench along toe of bank
SA CK LB	S-73	40,735	40,708	27	RR BANK	NO-ACTION	Grouted RR wall up to WSE + 5 ft; fair condition
SA CK LB	A-39	40,708	40,461	247	CLASS A	NO-ACTION	Relatively stable ch position in straight reach
SA CK LB	B-18	40,461	40,419	42	CLASS B	NO-ACTION	Recent low- and mid-bank erosion at site where vert conc ret wall completely failed; Broken conc wall pieces laying in ch along toe of bank deflect erosion pressure off of LB at site and d/s LB site and toward rapidly eroding d/s RB site(s); Loose, unstable fine-grained alluvium exposed in bank above failed wall; Toe of bank appears stable and somewhat protected by remnant of failed wall; No mature riparian trees or structures appear threatened by potential continuing bank erosion or upper bank failure; Establishing riparian vegetation at site would not increase riparian tree canopy cover in reach due to E-W canyon floor alignment; Stabilizing site would achieve sediment source reduction objective only; May be possible to remove or break up/reconfigure broken conc wall pieces resulting from wall failure at site in order to reduce erosion pressure forced by pieces onto rapidly eroding d/s RB site(s)
SA CK LB	A-38	40,419	40,398	21	CLASS A	NO-ACTION	Relatively stable ch position in straight reach, somewhat protected by u/s vert conc ret wall failure
SA CK LB	S-72	40,398	40,346	52	RR BANK	NO-ACTION	RR bank appears encroached into ch approx. 6-8 horiz ft

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	B*-15	40,346	40,271	76	CLASS B*	ACTION	Recent bank failure and continuing bank erosion on approx. 25-30 ft-high 1(H):1(V) to 1(H):1.5(V) (var.) sloped bank along relatively straight ch reach; Existing non-native and native riparian trees and existing fence at TOB are threatened by continuing erosion; Establishing riparian vegetation at site would not increase riparian tree canopy cover in reach due to E-W canyon floor alignment; Med density clay exposed in toe of bank; Erosion and failure in unconsolidated alluvium above clay horizon; May not be necessary to use RR to stabilize toe of bank; Recommend laying back bank from OHW to TOB at max finished 1.5(H):1(V) slope and placing vegetated biodegradable geofabric erosion control on slope; Also recommend moving existing LWD pieces at u/s end of site and cabling pieces to 1/2-ton RR pieces at selected location along toe of bank nr u/s end of site to deflect erosion pressure off of toe of bank at site; Also recommend limiting grading to save existing buckeye tree at mid-bank nr d/s end of site
SA CK LB	A-37	40,271	40,226	45	CLASS A	NO-ACTION	Relatively stable, well-vegetated bank in relatively straight reach
SA CK LB	S-71	40,226	40,151	75	RR BANK	NO-ACTION	Grouted RR bank; Good condition
SA CK LB	A-36	40,151	40,006	145	CLASS A	NO-ACTION	Relatively stable, well-vegetated bank in straight ch reach
SA CK LB	B-17	40,006	39,885	121	CLASS B	ACTION	Recent and likely continuing low- and mid-bank erosion along approx. 13-14 ft-high 1(H):2(V) (var.) and locally steeper sloped bank; Dense alluvial material exposed in toe of bank; 1 large mature riparian, tree, deck, fence all appear threatened by potential slope failure in unconsolidated alluvial upper bank materials; Establishing riparian vegetation at site would not improve existing tree canopy cover in reach due to close proximity of RB canyon wall along RB; Site stabilization would achieve sediment source site reduction and pvt property protection objectives only; Recommend removing threatened tree, deck, and fence nr TOB and laying back from OHW to TOB at max stable slope, approx. 1.25(H):1(V) slope, and covering finished bank with vegetated geofabric erosion control; May be possible to save TOB tree, deck, and fence by constructing vert conc ret wall or vert timber ret wall or steep vegetated 1/4-ton RR bank at max 1(H):2(V) slope, extending down to WSE (-) 3-4 ft and up to WSE + 7-9 ft; Recommended RR bank would encroach min 2-3 ft into ch; Existing ch width and d/s ch conditions can accommodate 2-3 ft horiz encroachment from site
SA CK LB	A-35	39,885	39,846	39	CLASS A	NO-ACTION	Relatively stable inside bend ch position with gr bar along toe of bank

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/ Structure Class	Recommend Action/ No-Action	Site/Structure Description
SA CK LB	C-6	39,846	39,770	77	CLASS C	NO-ACTION	Long-term ongoing and recent bank erosion threatens potential bank failure and resulting loss of existing pvt property and 1 large mature riparian tree; Existing vegetated woody brush wall along bank; Saving threatened bay tree would have negligible impact on existing tree canopy cover in reach
SA CK LB	A-34	39,770	39,717	53	CLASS A	NO-ACTION	Recent erosion and lack of vegetation cover on low- and mid-bank; Erosion appears self-stabilizing; No mature riparian trees or structures appear threatened by potential continuing erosion
SA CK LB	C-5	39,717	39,705	12	CLASS C	ACTION	Existing mature bay tree undercut by long-term low-bank erosion; Stabilizing bay tree would likely require installation of approx. 10 ft-long 6 ft-high RR wall amongst and beneath exposed tree roots; Saving tree would have negligible impact on existing tree canopy cover in reach
SA CK LB	C-4	39,705	39,627	78	CLASS C	NO-ACTION	Numerous mature trees undercut and threatened by long-term bank erosion; Site-specific design recommendation depends on status of u/s Class C recommended ACTION site
SA CK LB	A-33	39,627	39,523	104	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	S-70	39,523	39,464	59	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall; Approx. 4 ft-high fp bench along toe of structure
SA CK LB	S-69	39,464	39,432	32	GABION WALL	NO-ACTION	Approx. 6 ft-high 1(H):3(V) sloped gabion wall up to WSE + 6 ft; Upper bank not well-vegetated; Establishing riparian trees on upper bank at site would have negligible impact on existing riparian tree canopy cover, but would improve riparian terrestrial wildlife habitat; Note: recommend canopy enhancement site
SA CK LB	S-68	39,432	39,385	47	VERT GABION WALL	NO-ACTION	Approx. 9 ft-high vert stacked gabion basket wall in very poor condition; Upstream end of gabion wall is prone to failure by outflanking; Existing gabion baskets rusting open along toe of structure
SA CK LB	S-67	39,385	39,364	22	RR TOE WALL	NO-ACTION	Good condition
SA CK LB	S-66	39,364	39,345	19	LIVE WILLOW WALL	NO-ACTION	Existing live willow wall at relatively stable ch position; Good condition
SA CK LB	S-65	39,345	39,328	17	VERT TIMBER RET WALL	NO-ACTION	Good condition
SA CK LB	S-64	39,328	39,313	15	RR TOE WALL	NO-ACTION	Good condition

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	B-16	39,313	39,261	52	CLASS B	NO-ACTION	Frequent minor low- and mid-bank erosion along approx. 15 ft-high 1(H):2(V) sloped bank; No structures appear threatened near TOB; Saving existing riparian vegetation from potential future bank erosion would have negligible impact on existing tree canopy cover in reach; Medium dense clay exposed in toe of bank
SA CK LB	B-15	39,261	39,211	50	CLASS B	NO-ACTION	Frequent minor low- and mid-bank erosion along approx. 15 ft-high 1(H):1(V) to 1(H):2(V) (var.) sloped bank; No structures appear threatened near TOB; Saving existing riparian vegetation from potential future bank erosion would have negligible impact on existing tree canopy cover in reach; No clay or dense alluvium exposed in toe of bank
SA CK LB	A-32	39,211	38,990	221	CLASS A	NO-ACTION	Relatively stable inside bend ch position with wide gr bar and fp bench along toe of bank
SA CK LB	S-63	38,990	38,982	8	RR BANK	NO-ACTION	Grouted; Good condition
SA CK LB	S-62	38,982	38,963	19	RR BANK	NO-ACTION	RR bank appears encroached into ch up to approx. 6-8 horiz ft along site
SA CK LB	S-61	38,963	38,920	44	RR BANK	NO-ACTION	Relatively new RR bank appears encroached into ch up to approx. 6 horiz ft along site
SA CK LB	S-60	38,920	38,898	22	VERT TIMBER RET WALL	NO-ACTION	Existing intact remnant of vert timber ret wall structure partially protects imm d/s Class B site
SA CK LB	B-14	38,898	38,859	39	CLASS B	NO-ACTION	Recent and continuing minor bank erosion d/s from partially failed timber ret wall and u/s from stable inside bend ch position imm u/s from Meadow Way bdge; Site stabilization would achieve sediment source site reduction only
SA CK LB	A-31	38,859	38,827	32	CLASS A	NO-ACTION	Stable inside bend ch position d/s from Meadow Way bdge
SA CK LB	S-59	38,827	38,804	23	BDGE	NO-ACTION	Meadow Way bdge crossing; 31 ft-wide by 18+ ft-high timber pier supported timber bridge deck; Grouted RR bank at LB; Bdge crossing does not appear to be a fish passage barrier or a flood constriction
SA CK LB	S-58	38,804	38,734	69	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall up to WSE + 8 ft with 2 ft-wide conc apron along toe of wall; Good condition
SA CK LB	S-57	38,734	38,695	39	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall; good condition
SA CK LB	S-56	38,695	38,642	53	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall; good condition
SA CK LB	A-30	38,642	38,352	290	CLASS A	NO-ACTION	Relatively stable ch position with densely-vegetated banks; banks appear to have been historically very unstable and probably composed of mixed unconsolidated alluvium and random construction fill; Banks appear recently stabilized by establishment of dense vegetation

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	S-55	38,352	38,271	81	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall up to WSE + 8 ft with 2 ft-wide conc apron along toe of wall; Good condition
SA CK LB	S-54	38,271	38,257	14	GABION WALL	NO-ACTION	Gabion wall up to WSE + 12 ft in poor condition; Existing gabion baskets rusted out along toe of wall
SA CK LB	B-13	38,257	38,161	96	CLASS B	NO-ACTION	Frequent minor low- and mid-bank erosion along nr-vert approx. 15 ft-high bank in straight ch position; Med dense clay exposed in toe of bank; Mature TOB riparian trees not imm threatened but would be lost if bank were laid back to stable slope; No structures appear threatened by potential future bank failure;
SA CK LB	A-29	38,161	38,113	47	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	B-12	38,113	38,037	76	CLASS B	NO-ACTION	Frequent and recent minor low- and mid-bank erosion; Existing mature trees but no structures threatened near TOB; Saving existing TOB trees from potential erosion into ch would have negligible impact on existing tree canopy cover; Bank appears composed of landslide deposit; Relatively good vegetative cover on bank; Site stabilization would achieve sediment source site reduction objective only
SA CK LB	A-28	38,037	37,925	113	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	C-3	37,925	37,871	53	CLASS C	NO-ACTION	Long-term minor low- and mid-bank erosion along approx. 7 ft-high bank created undercut trees prone to failure into channel; Stabilizing threatened trees would have negligible impact on existing tree canopy cover in reach; Existing channel width is adequate to accommodate possible RR bank structure beneath threatened trees;
SA CK LB	B-11	37,871	37,865	6	CLASS B	NO-ACTION	Frequent minor bank erosion along approx. 25 ft-high 1(H):3(V) sloped bank threatens numerous mature trees but no structures appear near TOB; Existing ch bkf w is 25 ft, less than the recommended min design bkf ch width of 31 ft for this site; Difficult to stabilize bank at existing bank slope to save existing mature trees; Construction equipment access needs to be confirmed
SA CK LB	B-10	37,865	37,841	24	CLASS B	NO-ACTION	Long-term frequent minor bank erosion created nr vert bank at site; Relatively narrow ch reach; Construction equipment access appears limited; Difficult to stabilize site without constructing vertical conc ret wall, vert timber ret wall, or steep vegetated RR bank that encroaches into ch min 4-5 horiz ft; Allowing encroachment by new structure into ch not recommended at this site due to relatively narrow ch conditions in this reach; Priority of pvt property protection cannot be assessed
SA CK LB	S-53	37,841	37,825	16	RR BANK	NO-ACTION	Grouted; Good condition

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/ Structure Class	Recommend Action/ No-Action	Site/Structure Description
SA CK LB	B-9	37,825	37,767	58	CLASS B	NO-ACTION	Frequent and recent low- and mid-bank erosion along 1(H):3(V) sloped bank threatens TOB fence but no mature trees; Moderately dense gr alluvium (B Horizon) exposed in toe of bank; If bank can be laid back and TOB fence moved back accordingly, then site could be made stable at max approx. 1.25(H):1(V) bank slope and simple erosion control; May be possible to stabilize bank without RR toe protection given presence of med density gr alluvium in toe of bank; Priority for private property protection cannot be assessed
SA CK LB	C-2	37,767	37,740	27	CLASS C	NO-ACTION	Frequent and recent low- and mid-bank erosion along 1(H):3(V) sloped bank threatens several partially undercut mature trees but no structures appear near TOB; Dense gr alluvium (B Horizon) exposed in toe of bank; TOB trees would be lost if site is stabilized by laying back bank, similar to recommendation for imm u/s Class B site; Site-specific recommendation depends on priority for pvt property protection for site and treatment of imm u/s Class B site; Priority for private property protection cannot be assessed
SA CK LB	A-27	37,740	37,671	68	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	S-52	37,671	37,582	89	RR BANK	NO-ACTION	RR bank; It class
SA CK LB	A-26	37,582	37,558	24	CLASS A	NO-ACTION	Relatively stable inside bend ch position with LB fp unit; remnants of low-head concrete dam at d/s end of site stabilize LB fp unit and bank condition along site
SA CK LB	S-51	37,558	37,448	110	RR TOE WALL	NO-ACTION	RR toe wall; Good condition
SA CK LB	S-50	37,448	37,405	42	GABION WALL	NO-ACTION	Existing gabion basket wall in stable ch position with fine sediment covered bar along toe of wall

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	B*-14	37,405	37,224	181	CLASS B*	ACTION	Long-term ongoing, and recent severe bank erosion along outside bend ch position imm threatens TOB mature riparian trees and fence; No other structures appear nr TOB; Bank is approx. 16 ft-high and 1(H):3(V) to 1(H):3.5(V) sloped and locally steeper; Existing bkf ch width in reach is greater than 30-ft recommended min design bkf ch w for site; Site is within widest reach of Upper San Anselmo Ck, with a wide RB gr bar and fp bench, evidently caused by long-term ongoing outside bend ch bank erosion at LB sites; Existing riparian tree canopy cover limited due to wide, unvegetated RB gr bar and lack of riparian trees at oversteepened and frequently eroding LB sites; Stabilizing bank and existing TOB trees and structures and protecting existing pvt property <i>without</i> encroaching into existing ch would require a vert or nr vert bank stabilization structure; Recommended instead to allow max 10-14 horiz ft of encroachment into ch from existing LB OHW to allow construction of a stable structure that could potentially support riparian vegetation establishment for improving near-shore vegetative and overhead canopy cover in reach; Recommend construction of live willow pole vegetated 1/4-ton min RR toe wall down to WSE (-) 3-4 ft and up to WSE + 6-9 ft; with upper bank constructed at max stable 1.5(H):1(V) slope from top of RR toe wall up to existing TOB from MSE soil lifts, and covered with vegetated biodegradable geofabric erosion control; Plantings would need to be irrigated for successful vegetation establishment at site
SA CK LB	B-8	37,224	37,161	63	CLASS B	NO-ACTION	Long-term ongoing, and recent severe bank erosion along outside bend ch position along approx. 6-8 ft-high and 1(H):3(V) to 1(H):6(V) sloped bank with few riparian trees and no structures threatened near TOB; Existing bkf ch width in reach is greater than 30-ft recommended min design bkf ch w for site; Site is within widest reach of Upper San Anselmo Ck, with a wide RB gr bar and fp bench, evidently caused by long-term ongoing outside bend ch bank erosion at LB sites; Existing riparian tree canopy cover limited due to wide, unvegetated RB gr bar and lack of riparian trees at oversteepened and frequently eroding LB sites; Stabilizing bank and existing TOB trees and structures and protecting existing pvt property <i>without</i> encroaching into existing ch would require a vert or nr vert bank stabilization structure; Recommended instead to allow max 6-10 horiz ft of encroachment into ch from existing LB OHW to allow construction of a stable structure that could potentially support riparian vegetation establishment for improving near-shore vegetative and overhead canopy cover in reach; Site-specific design recommendation depends on project status and design of imm u/s Class B* site as would affect the near-shore hydraulics and erosion pressure along site; Erosion pressure at the site would be significantly reduced if u/s Class B* site stabilization structure encroaches into ch approx. 10-14 horiz ft; May be possible to stabilize site without RR toe protection and reconstructing the bank at max stable 1.5(H):1(V) to 2(H):1(V) slope with MSE soil lifts covered with vegetated biodegradable geofabric erosion control and live willow wall along finished toe of bank; Site is also excellent candidate for successful reconstruction and stabilization with live willow brush mattress; Upper bank plantings would need to be irrigated for successful vegetation establishment at site

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	S-49	37,161	37,125	36	RR BANK	NO-ACTION	Good condition
SA CK LB	S-48	37,125	37,102	23	RR BANK	NO-ACTION	Grouted; Good condition
SA CK LB	S-47	37,102	37,092	9	RR BANK	NO-ACTION	Grouted RR bank; vert timber ret wall above
SA CK LB	S-46	37,092	37,042	50	VERT TIMBER RET WALL	NO-ACTION	Good condition
SA CK LB	S-45	37,042	37,005	37	RR BANK	NO-ACTION	Grouted; Good condition
SA CK LB	A-25	37,005	36,789	216	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	B-7	36,789	36,754	35	CLASS B	NO-ACTION	Minor recent bank erosion at site, but site appears potentially vulnerable to future erosion due to recent bank failure at u/s RB site that deposited coarse RR in ch and deflected erosion pressure toward LB site(s); It is recommended that u/s RB site is treated to reduce erosion pressure at vulnerable LB site(s)
SA CK LB	S-44	36,754	36,708	45	RR BANK	NO-ACTION	Good condition
SA CK LB	B*-13	36,708	36,647	61	CLASS B*	ACTION	Recent major bank erosion and likely continuing bank erosion along 5-10 ft-high (var.) min 1(H):2(V) and locally nr vert bank exposing med dense gr alluvium; Recommend stabilizing site by laying back bank from OHW to TOB to stable 1.5(H):1(V) max slope and protecting finished slope with vegetated biodegradable geofabric erosion control; Priority for above TOB pvt prop protection cannot be assessed
SA CK LB	B*-12	36,647	36,593	54	CLASS B	ACTION	Frequent minor bank erosion along approx. 10 ft-high bank; Recommend stabilizing site by laying back bank from OHW to TOB to stable 1.5(H):1(V) max slope and protecting finished slope with vegetated biodegradable geofabric erosion control; Priority for above TOB pvt prop protection cannot be assessed
SA CK LB	A-24	36,593	36,543	50	CLASS A	NO-ACTION	Stable inside bed ch position with LB fp unit

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	B*-11	36,543	36,515	28	CLASS B*	ACTION	Difficult site; Recent and likely continuing major bank erosion along low- and mid-bank of approx. 15-16 ft-high nr-vert bank with existing vert conc and vert timber ret wall at upper bank along outside bend ch position; RB is 7-10 ft-high (var.) fp unit with existing RR bank protection, existing mature vegetation, and residential structures; Continued erosion and major bank failure likely at site; Difficult to stabilize bank because of relatively high nr-vert condition at outside bend ch position and relatively narrow ch conditions u/s from and within site (ch w increases appreciably at adjacent d/s Class B* site); Existing tree canopy cover is poor to fair in ch reach and limited in the vicinity of the site by relatively young vegetation on the RB fp bench and lack of potentially overhanging trees on destabilized LB sites; Recommend project to stabilize raw nr vert bank and existing vert conc ret wall at upper bank and improve canopy cover in reach by allowing establishment of riparian trees; Site specific design recommendation depends on project action status and design selected for imm d/s Class B* site and vice-versa; Both adjacent Class B* sites should be designed in direct coordination to ensure successful site stabilization and maximize potential for tree canopy restoration along sites; Site specific design for both adjacent Class B* sites depends on flexibility of RB landowners to potentially allow for existing RB RR banks to be laid back to restore active fp bench (i.e., at WSE + 3 ft rather than 7-10 ft) fp bench, as would reduce erosion pressure at LB Class B* sites and increase the ch capacity for accommodating more stable, gradually sloped bank stabilization structures
SA CK LB	B*-10	36,515	36,426	88	CLASS B*	ACTION	Difficult site; Recent and likely continuing major bank erosion and upper bank failure on approx. 17-19 ft-high nr-vert bank and no mature TOB trees at outside bend ch position; Upslope existing structure not imm threatened by likely continuing erosion; Existing bkf ch width is 37 ft at site, more than the recommended 30 ft min design bkf width for site; RB is 7-10 ft-high (var.) fp unit with existing RR bank protection, existing mature vegetation, and residential structures; Continued erosion and major bank failure likely at site; Difficult to stabilize bank because of relatively high nr-vert condition at outside bend ch position; Existing tree canopy cover is poor to fair in ch reach and limited in the vicinity of the site by relatively young vegetation on the RB fp bench and lack of potentially overhanging trees on destabilized LB sites; Recommend project to stabilize raw nr vert bank and existing vert conc ret wall at upper bank and improve canopy cover in reach by allowing establishment of riparian trees; Site specific design recommendation depends on project action status and design selected for imm d/s Class B* site and vice-versa; Both adjacent Class B* sites should be designed in direct coordination to ensure successful site stabilization and maximize potential for tree canopy restoration along sites; Site specific design for both adjacent Class B* sites depends on flexibility of RB landowners to potentially allow for existing RB RR banks to be laid back to (cont...) restore active fp bench (i.e., at WSE + 3 ft rather than 7-10 ft) fp bench, as would reduce erosion pressure at LB Class B* sites and increase the ch capacity for accommodating more stable, gradually sloped bank stabilization structures

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	A-23	36,426	36,216	210	CLASS A	NO-ACTION	Stable inside bed ch position with LB fp unit with some local minor bank toe erosion exposing dense gr alluvium nr toe of bank; Note: recommended canopy enhancement site on LB fp bench
SA CK LB	S-43	36,216	36,200	16	RR TOE WALL	NO-ACTION	Good condition
SA CK LB	A-22	36,200	36,116	83	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	S-42	36,116	36,072	44	RR BANK	NO-ACTION	Good condition
SA CK LB	B*-9	36,072	36,043	29	CLASS B*	ACTION	Recent major upper bank slump failure eroded multiple trees into ch and likely continuing mid-bank erosion at d/s end of failure at site threatens to erode three mature riparian trees at mid- and upper bank into ch; Existing fence at TOB; Construction equipment access appears good from TOB; Med dense clay exposed in toe of bank at site; Recommend stabilizing bank by laying back bank from OHW to TOB at stable max 1.5(H):1(V) slope and covering finished slope with vegetated biodegradable geofabric for surface erosion control; Also recommend installing cabled RR-LWD structure along toe of finished bank nr u/s end of site to encourage gr bar deposit and additional vegetation establishment along toe of finished bank; Priority for pvt property protection at TOB cannot be assessed; If a steep bank stabilization structure is required for protecting existing pvt property along TOB, then recommend vegetated 1/4-ton 1(H):1(V) max sloped RR bank from WSE (-) 2-3 ft up to WSE + 8-10 ft with vegetated geofabric covered MSE at max 1.25(H):1(V) slope bank treatment above finished RR bank
SA CK LB	A-21	36,043	35,915	128	CLASS A	NO-ACTION	Stable inside bend ch position
SA CK LB	B-6	35,915	35,879	36	CLASS B	NO-ACTION	Non-consequential trees threatened; not lacking in canopy; Recommended No Action.
SA CK LB	S-41	35,879	35,830	48	RR BANK	NO-ACTION	RR bank appears constructed by dumping 1/4-ton to 1/2-ton RR pieces in ch; Appears encroached min 10 horiz ft into ch; RR bank provides protection for existing LB storm drain;

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	B*-8	35,830	35,806	24	CLASS B*	ACTION	Difficult site; Recent low- and mid-bank bank erosion and major upper bank failure and tree throws along approx. 15 ft-high 1(H):1.75(V) to 1(H):2(V) sloped bank imm d/s from heavily encroached RR bank; Likely continuing mid-bank erosion and upper bank failures expected to throw severely undermined oak tree at TOB; Med density clay exposed in toe of bank; Upper bank material is loose, unconsolidated fine-grained alluvium (A horizon); Construction equipment access appears possible from TOB but needs to be confirmed; Existing tree canopy cover is fair-good in reach, but dominated by numerous bay and alder trees along RB that are threatened by RB erosion; Establishing new riparian trees at site would have minor impact on existing canopy cover due to E-W ch alignment but may provide long-term benefit if RB TOB trees erode into ch or are cut to reduce their debris blockage potential; No structures appear threatened nr TOB, but TOB pvt property appears recently landscaped; Recommend project to stabilize upper bank and establish nearshore cover and riparian canopy forming trees; Recommend constructing vegetated RR bank from WSE (-) 3-4 ft up to WSE + 9-11 ft at max 1(H):1(V) to 1.25(H):1(V) finished face slope with MSE upper bank at max 1.25(H):1(V) finished slope up to TOB, covered with vegetated geofabric erosion control; Also recommend removing undermined oak tree at TOB; Priority for pvt property protection nr TOB cannot be assessed
SA CK LB	S-40	35,806	35,779	27	SACKRETE BANK	NO-ACTION	Approx. 4 ft-high sackrete toe wall with 7 ft-high RR bank above; Structures appear to have stabilized approx. 15 ft-high bank
SA CK LB	A-20	35,779	35,749	30	CLASS A	NO-ACTION	Relatively stable ch position d/s from sackrete and RR bank heading into slight outside bend
SA CK LB	A-19	35,749	35,728	21	CLASS A	NO-ACTION	Major (ca. 1982) upper bank failure appears self-stabilized; Med dense clay intact and exposed along toe of bank
SA CK LB	A-18	35,728	35,714	14	CLASS A	NO-ACTION	Relatively stable ch position heading into outside bend
SA CK LB	S-39	35,714	35,624	89	RR BANK	NO-ACTION	Steep 1/4-ton to 1/2-ton RR bank along outside bend ch position heading into Fairfax-Bolinas Rd culvert; Upper bank above wall is steep and well-vegetated; Future upper bank failure and tree throw appears likely due to steepness of bank and has potential to block flow at entrance to Bolinas-Fairfax Rd culvert
SA CK LB	S-38	35,624	35,577	47	CULVERT	NO-ACTION	Bolinas-Fairfax Rd bdge crossing; 18 ft-wide by 13 ft-high reinforced conc rect culvert with conc bottom (at grade); Local effective ht of opening is approx 10-11 ft due to hanging sewer pipe
SA CK LB	A-17	35,577	35,388	189	CLASS A	NO-ACTION	Relatively stable inside bend ch position with fp bench along toe of bank; Med dense clay exposed up to above bkf WSE along d/s end of site

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	B*-7	35,388	35,351	37	CLASS B*	ACTION	Recent major upper bank failure on approx. 18-20 ft-high 1(H):1(V) sloped bank along outside bend channel position; Med dense clay toe exposed up to WSE + 3 ft appears recently eroded along toe and somewhat self-stabilized along existing toe alignment through toe of existing vert conc ret wall imm d/s from site; Existing canopy cover is excellent in reach; Establishing vegetation at site would have negligible impact on tree canopy cover; Residential structure appears threatened by likely continuing upper bank erosion and shallow upper bank failures near TOB; Construction equipment access appears very limited at TOB due to close proximity of residential structures; Recommend project to stabilize bank up to threatened deck footings while maintaining and enhancing the existing scour pool at the d/s end of the site by adding stable, self-sustaining near-shore vegetative cover; Steepness of existing slope, outside bend ch position, and need to maintain existing grade near TOB structures eliminates option of laying back bank to typical stable 1.5(H):1(V) slope; Recommend constructing live willow pole vegetated 1/4-ton to 1/2-ton RR bank at max 1(H):1(V) slope from WSE (-) 3-5 ft and up to WSE + 9-11 ft; Also recommend u/s end of RR bank be positioned inside of vert exposed clay banks at u/s end of site and d/s end of RR bank be 1-2 ft outside of the u/s end of the exiting vert conc ret wall imm d/s from site (to protect failing wall foundation); Recommend RR bank toe alignment would largely avoid filling the existing scour pool at the site; Also recommend placing RR-LWD rootwad cabled structure along toe of finished RR bank nr its u/s end to encourage the existing scour pool to lengthen along the finished RR bank; Recommend dense planting of live willow poles within toe of RR bank; If construction equipment access and/or cost prohibits use of RR to stabilize bank, then recommend hand-work to place vegetated geofabric erosion control on approx. 1(H):1(V) sloped bank from approx. WSE + 3 ft to TOB and motorized wheelbarrow and lawn-size tractor work to move RR and LWD rootwad pieces to site for installing cabled RR-LWD structures along toe of existing bank to protect existing clay toe from additional future erosion as would imm destabilize upper bank

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	S-37	35,351	35,345	5	VERT CONC RET WALL	ACTION	5 ft-long u/s wingwall section of existing vert conc ret wall undermined approx. 3 vert ft by recent bank toe erosion in exposed med dense clay; Construction equipment access appears limited at TOB due to close proximity of residential structures; Existing scour pool at toe of wall spans d/s end of u/s Class B* site and u/s end of existing vert conc ret wall; If the imm u/s Class B* site is stabilized by recommended RR bank, the finished face of the RR bank should extend 1-2 ft toward the ch C/L to protect the u/s end of the wall at site; Establishment of live willow pole vegetation at d/s end RR bank at u/s Class B* site would likely provide adequate protection for undermined wall at site; If u/s RR bank is not constructed, then recommend project to protect ret wall and minimize amount of fill placed in the existing scour pool at toe of wall; Does not appear possible to encourage the scour pool to move to more d/s location due to the vert conc pier on the front face of wall fixing pool location; May be possible to deflect erosion pressure from toe of wall within failure area by placing cabled RR-LWD structure(s) at edge of channel along toe of wall and establishing vegetation from live willow pole plantings in exposed clay at d/s end of Class B* site imm u/s from wall
SA CK LB	S-36	35,345	35,289	56	VERT CONC RET WALL	NO-ACTION	Existing vert conc ret wall up to WSE + 10 ft with RR toe wall up to WSE + 3 ft along toe of wall and deeper footing than u/s 5 ft-long undermined portion; Good condition
SA CK LB	C-1	35,289	35,205	84	CLASS C	ACTION	Long-term chronic low- and mid-bank erosion at d/s end of outside bend ch position imm d/s from vert conc ret wall threatens to throw numerous severely undermined TOB bay trees along site; Existing scour pool along toe of bank at u/s end of site; Existing gr bar deposit only toe of bank along middle and d/s end of site; Threatened mature trees contribute significant portion of existing tree canopy cover in reach; Existing u/s vert conc ret wall and RR toe wall appears to have encroached into ch several horiz ft and provides some erosion protection along site; Majority of bank erosion may have occurred prior to u/s wall construction; Construction equipment access appears good from TOB; Recommend project to stabilize existing TOB trees and encourage new canopy forming riparian trees along toe of bank and mid-bank to ultimately replace canopy from threatened trees; Due to partial erosion protection from u/s vert conc ret wall and RR toe wall, may be possible to accomplish project objectives without constructing typical vegetated RR bank; Recommend constructing engineered cable-anchored LWD jam up to WSE + 6-7 ft along face of bank along site, including rootwads projecting out from toe of jam structure into scour pool at u/s end of site; Also recommend backfilling structure with clean, washed river gravel as necessary and planting densely with live willow poles and native alder 1-gal container plants at protected positions within and along toe of jam structure
SA CK LB	A-16	35,205	35,031	174	CLASS A	NO-ACTION	Relatively stable ch position with gradually sloped upper bank with bedrock (chert) outcrop forming ch bank at d/s end of site; Few mature riparian trees in d/s end of site; Recommend canopy enhancement

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/ Structure Class	Recommend Action/ No-Action	Site/Structure Description
SA CK LB	BR-1	35,031	34,988	42	BR BANK/OC	NO-ACTION	Massive chert bedrock outcrop in bed and bank; Ch bed covered with conc grout between LB BR bank and RB grouted RR bank; Concrete lined bed spills 2 vert ft into 4 ft-deep scour pool
SA CK LB	A-15	34,988	34,862	126	CLASS A	NO-ACTION	Relatively stable inside bend ch position with high fp bench d/s from bedrock outcrop
SA CK LB	S-35	34,862	34,845	17	RR TOE WALL	NO-ACTION	Fair condition
SA CK LB	S-34	34,845	34,781	64	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall up to WSE + 5 ft appears partial foundation for residential structure directly above LEW; Poor condition
SA CK LB	S-33	34,781	34,756	24	VERT CONC RET WALL	NO-ACTION	Poor condition
SA CK LB	B-5	34,756	34,747	9	CLASS B	NO-ACTION	Recent low- and mid-bank erosion on approx. 1(H):1(V) sloped bank between u/s and d/s nr vert stabilization structures; Erosion appears self-stabilizing; No TOB mature riparian trees or structures appear imm threatened by possible continuing bank erosion; Recommend establishing shade-tolerant near-shore and mid-bank vegetation at site
SA CK LB	S-32	34,747	34,734	13	RR BANK	NO-ACTION	Fair condition
SA CK LB	S-31	34,734	34,708	26	VERT GABION WALL	NO-ACTION	Existing gabion wall up to WSE + 9 ft with existing alder tree root stabilized gr bar material along toe of structure; Appears stable
SA CK LB	S-30	34,708	34,697	11	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall up to WSE + 12 ft with an 8 ft-wide conc apron along toe of wall
SA CK LB	S-29	34,697	34,678	19	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall up to WSE + 8 ft at u/s end of outside bend ch position with 4 ft-high vert timber ret wall above; Alignment of vert conc ret wall face deflects majority of bkf and lower flows away from LB Class B* site imm d/s
SA CK LB	B*-6	34,678	34,662	15	CLASS B*	ACTION	FFX site; Recent major upper bank erosion at site above existing native maple tree that stabilizes toe of bank at site; Construction access good from TOB; Recommend protecting maple tree roots and stabilizing upper bank upslope from maple tree roots using light class and larger RR at max 1(H):1(V) slope up to WSE + 9 ft and establishing vegetation on the upper bank above the placed RR; Also recommend trying to establish willow along toe of bank to improve erosion protection for maple roots exposed between WSE + 2 ft and WSE + 5-6 ft nr the d/s end of the site; <i>See detailed site description and design recommendations in report</i>

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	S-28	34,662	34,628	34	RR BANK	ACTION	FFX site; Recent severe low- and mid-bank erosion along outside bend ch position imm u/s from Creek Rd bdge and major bank failure occurred during Dec-31-05 flood and 1/8-ton to 1/4-ton RR appears to have been dump placed on bank on an emergency basis to protect Creek Rd bdge from potential additional destabilization; Bank appears stable as is; Recommend vegetating as much as possible the upper bank upslope from the new RR bank and along the toe of the structure; <i>See detailed site description and design recommendations in report</i>
SA CK LB	B*-5	34,628	34,565	63	CLASS B* / BDGE	ACTION	FFX site; Recent severe low- and mid-bank erosion along outside bend ch position beneath Creek Road bdge exposed LB abutment; Stability of bridge and exposed abutment cannot be assessed without structural and geotechnical engineering analysis; Recommend project to stabilize existing exposed abutment and reconstruct ch bank beneath bridge consistent with repair recommended for imm d/s Class B* bank failure; The existing ch width in reach is significantly greater than the recommended min design ch bkf width in reach; Recommend lining finished reconstructed bank with 1.25(H):1(V) max sloped 1/2-ton RR bank from WSE (-) 4-6 ft up to WSE + 9-12 ft; Difficult to vegetate toe of finished RR bank due to shading beneath bridge deck; <i>See detailed site description and design recommendations in report</i> ; Note: Creek Rd bdge not a flood constriction
SA CK LB	B*-4	34,565	34,555	10	CLASS B*	ACTION	FFX site; Recent major low- and mid-bank erosion and upper bank failure in approx. 18-19 ft-high bank at outside bend ch position imm d/s from Creek Rd bdge; Existing riparian tree canopy cover good in reach and would not be significantly improved by establishing additional mature riparian trees at site; Existing pvt driveway and one native oak tree threatened by likely continuing bank erosion and upper bank settlement; Construction access good from TOB; Recommend stabilizing bank and establishing near shore riparian vegetation along toe of structure by constructing a 1.25(H):1(V) max sloped 1/2-ton RR bank from WSE (-) 4-6 ft up to WSE + 9-12 ft; Recommend reconstructing upper bank above RR bank with MSE soil lifts and vegetated geofabric erosion control at max finished slope of 1.5(H):1(V); <i>See detailed site description and design recommendations in report</i>
SA CK LB	A-14	34,555	34,473	81	CLASS A	NO-ACTION	Stable inside bend ch position
SA CK LB	B*-3	34,473	34,453	20	CLASS B*	NO-ACTION	Recent and likely continuing bank erosion; No mature riparian vegetation or structures threatened by potential future erosion at site; Med dense clay exposed in toe of bank; Construction equipment access conditions cannot be assessed; Stabilizing site would achieve sediment source site reduction objective only
SA CK LB	A-13	34,453	34,184	268	CLASS A	NO-ACTION	Relatively stable ch position; Existing alder roots stabilize toe of bank

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	S-27	34,184	34,117	67	VERT TIMBER RET WALL	NO-ACTION	Vert conc pier timber ret wall up to WSE + 6 ft in poor condition; no mature vegetation or structures threatened at TOB; Bank behind wall appears composed of construction backfill
SA CK LB	S-26	34,117	34,090	27	VERT TIMBER RET WALL	NO-ACTION	Vert conc pier timber ret wall up to WSE + 6 ft in poor and failing condition; no mature vegetation or structures threatened at TOB; Bank behind wall appears composed of construction backfill
SA CK LB	S-25	34,090	34,070	19	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall up to WSE + 9 ft at outside bend ch position; Existing residential structure and mature trees at TOB
SA CK LB	B-4	34,070	33,997	73	CLASS B	NO-ACTION	Frequent minor low- and mid-bank erosion along approx. 13 ft-high 1(H):2(V) sloped bank with med dense clay exposed in toe of bank and existing gr bar deposit along toe of bank w/in site; 1 mature bay tree at TOB and residential outbuilding structure appear threatened by future potential bank failure at site; Existing tree canopy cover very good in reach; Construction equipment access appears good; Does not appear feasible to lay back the bank to max stable 1.25(H):1(V) slope at site without losing TOB tree and requiring moving the existing outbuilding structure; Steep RR bank or vertical ret wall structure may be required to protect TOB pvt property; Priority for protecting pvt property at TOB cannot be assessed; Recommend planting gr bar along toe of bank with native alder 1-gal container plants
SA CK LB	A-12	33,997	33,873	124	CLASS A	NO-ACTION	Stable inside bend ch position; Existing alder and maple tree roots stabilize toe of bank
SA CK LB	S-24	33,873	33,834	38	VERT TIMBER RET WALL	NO-ACTION	Vert timber ret wall with RR toe protection; good condition
SA CK LB	A-11	33,834	33,816	18	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	S-23	33,816	33,791	25	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall; good condition
SA CK LB	S-22	33,791	33,786	4	SACKRETE WALL	NO-ACTION	Sackrete bank in good condition
SA CK LB	S-21	33,786	33,752	34	VERT TIMBER RET WALL	NO-ACTION	Vert timber ret wall in good condition
SA CK LB	B-3	33,752	33,722	30	CLASS B	NO-ACTION	Recent minor bank erosion; Dense clay exposed in toe of bank; Existing bank slope is relatively gradual and appears overall stable; Ch position somewhat protected by upstream and downstream structures with alders in gravel bar toe; Recommended No Action.
SA CK LB	S-20	33,722	33,675	47	TRIB CONF	NO-ACTION	Fairfax Ck within 10 ft-wide 6 ft-high Fairfax-Bolinas Rd culvert
SA CK LB	S-19	33,675	33,640	34	RR BANK	NO-ACTION	RR placed on mid-bank above clay exposed along toe of bank

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	A-10	33,640	33,608	32	CLASS A	NO-ACTION	Relatively stable ch position; Existing alder roots stabilize toe of bank
SA CK LB	S-18	33,608	33,598	10	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall up to WSE + 6 ft; Good condition
SA CK LB	A-9	33,598	33,464	134	CLASS A	NO-ACTION	Relatively stable ch position; Existing alder roots stabilize toe of bank
SA CK LB	S-17	33,464	33,437	26	GABION WALL	NO-ACTION	Approx. 1(H):2(V) sloped gabion wall up to WSE + 9 ft
SA CK LB	S-16	33,437	33,303	134	RR BANK	NO-ACTION	RR bank in good condition
SA CK LB	A-8	33,303	33,180	122	CLASS A	NO-ACTION	Relatively stable ch position within overwidened ch reach u/s from Pacheco Dam
SA CK LB	S-15	33,180	33,177	3	DAM	NO-ACTION	Existing "Pacheco Dam" is abandoned concrete cased sewer pipeline crossing; Intact reinforced concrete casement and d/s concrete apron continues to provide grade control primarily affecting existing condition and stability of u/s sites; Appears that dam removal could be accomplished without significantly compromising bank stability u/s and d/s, but more detailed analysis would be required to confirm and specify necessary treatments; Recommend dam removal be considered only as component of comprehensive reach-scale bank stabilization and channel restoration plan and design needed for the RB MT&CC site, as would also affect multiple d/s LB flood prone private residential properties; Dam is fish barrier when low-flow outlet is jammed with woody debris
SA CK LB	S-14	33,177	33,166	11	CONC APRON	NO-ACTION	Conc apron drop structure on d/s side of Pacheco Dam
SA CK LB	S-13	33,166	33,099	67	RR BANK	NO-ACTION	1(H):3(V) sloped RR bank composed of large broken conc slabs up to WSE + 11 ft
SA CK LB	S-12	33,099	33,041	58	RR BANK	NO-ACTION	Nr vert grouted RR bank up to WSE + 8 ft with 4 ft-high vert timber ret wall above
SA CK LB	S-11	33,041	32,831	210	RR BANK	NO-ACTION	Mix of RR banks, grouted RR banks, and vert conc ret wall along site; difficult to distinguish individual structures
SA CK LB	A-7	32,831	32,747	84	CLASS A	NO-ACTION	Relatively stable ch position
SA CK LB	S-10	32,747	32,678	69	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall; Good condition
SA CK LB	A-6	32,678	32,597	81	CLASS A	NO-ACTION	Stable inside bend ch position with erosion protection from u/s vert conc ret wall and existing mature alder tree roots stabilizing toe of bank

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	B*-2	32,597	32,562	35	CLASS B*	ACTION	Landowner reports that flood flows within TOB residential area flow down Inyo Ave and return to San Anselmo Ck over approx. 14 ft-high unprotected bank at d/s end of site; Recent toe erosion at d/s end of site exacerbated by severe RB bank erosion at outside bend ch position imm u/s from site; Bank and toe erosion at d/s end of site threatens to outflank existing steep sackcrete wall structure imm d/s from site; Recommend project to stabilize toe of bank at d/s end of site to protect u/s end of existing sackrete wall and accommodate flood return flows down the bank without causing additional upper bank erosion; RR bank required for toe protection and spillway flow protection; Recommend constructing approx. 10 ft-long vegetated 1/4-ton to 1/2-ton max 1(H):1(V) sloped RR bank at the d/s end of site from WSE (-) 4-6 ft and up to WSE + 7-10 ft; Also recommend stabilizing upper bank above finished RR bank with vegetated geofabric erosion control and facing to It class RR lining if determined necessary to accommodate flood return flows from Inyo Ave; Recommend densely planting toe of RR bank with live willow poles
SA CK LB	S-9	32,562	32,505	57	SACKRETE WALL	NO-ACTION	Existing approx. 1(H):3.5(V) sloped sackrete wall up to WSE + 10 ft; Threatened by potential outflanking at u/s end within u/s Class B* site
SA CK LB	B-2	32,505	32,429	76	CLASS B	NO-ACTION	Recent minor bank erosion threatens mature tree nr TOB; Existing canopy cover excellent in reach; Loss of existing TOB trees would negligibly impact existing canopy cover; Med dense clay exposed in toe of bank; Construction equipment access conditions cannot be assessed; May be MT&CC property;
SA CK LB	A-5	32,429	32,362	67	CLASS A	NO-ACTION	Relatively stable ch position and bank condition with existing alder tree roots stabilizing toe of bank
SA CK LB	B-1	32,362	32,273	89	CLASS B	NO-ACTION	Frequent minor bank erosion along high relatively steep bank with completely failed vert steel I-beam timber ret wall with RR and broken conc rubble lining toe of bank; Large RR and broken conc rubble pieces along toe of bank provide some aquatic habitat cover; No mature trees or structures appear threatened nr TOB; Edge of shopping center parking lot along TOB
SA CK LB	S-8	32,273	32,006	267	RR BANK	NO-ACTION	Shopping center structure overhangs into ck; Ck banks lined with heavy RR; No vegetation survives under shopping center structure
SA CK LB	A-4	32,006	31,749	257	CLASS A	NO-ACTION	Relatively stable straight ch reach d/s from shopping center piers and u/s from Pastori Ave bdge culvert; Site may need to be stabilized as part of fish passage improvement and/or bdge crossing replacement alternatives currently under design development to improve fish passage through d/s Pastori Ave bdge culvert

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
SA CK LB	S-7	31,749	31,731	18	BDGE	ACTION	Pastori Ave bdge crossing; Approx. 28 ft-wide 10 ft-high reinforced concrete rectangular culvert with conc bottom and existing denil type fish ladder; Existing fish passage barrier; Does not appear to be a flood constriction
SA CK LB	S-6	31,731	31,697	34	VERT CONC D/S WINGWALL	ACTION	FFX SITE; Existing approx. 18 in-diam CMP storm drain outlet discharges onto bank at site; Recent bank failure at point of SD discharge during 12-31-05 flood; Recommend placing additional min light class up to 1/8-ton RR beneath storm drain outlet to stabilize bank currently covered with erosion control fabric; <i>See detailed site description and design recommendations in report</i>
SA CK LB	B*-1	31,697	31,669	28	CLASS B*	ACTION	Failed existing vert timber ret wall failure with conc grout toe apron imm d/s from Pastori Ave bridge; Existing TOB alder tree is dead; Recommend project to remove dead alder tree and reconstruct bank to prevent potential upper bank failure; Recommend removing tree and stump/roots, and laying back bank to max stable 1.25(H):1(V) slope and cover graded area with hand-placed It class RR and/or vegetated biodegradable geofabric erosion control
SA CK LB	S-5	31,669	31,596	73	VERT TIMBER RET WALL	NO-ACTION	Intact portion of vert timber ret wall in poor-fair condition; Existing alder tree roots partially stabilize toe of bank along wall; Portions of toe along base of wall reinforced with conc grout in poor condition
SA CK LB	S-4	31,596	31,574	22	VERT TIMBER RET WALL	NO-ACTION	Approx. 4 ft-high (var.) vert timber ret wall in stable ch position
SA CK LB	S-3	31,574	31,528	46	RR BANK	NO-ACTION	RR bank up to WSE + 5 ft with existing gr bar along toe of bank; Gr bar stabilized by existing alder tree roots
SA CK LB	A-3	31,528	31,435	93	CLASS A	NO-ACTION	Relatively stable ch position; Existing alder roots stabilize toe of bank
SA CK LB	S-2	31,435	31,269	166	RR BANK	NO-ACTION	RR bank in good condition
SA CK LB	A-2	31,269	30,868	401	CLASS A	NO-ACTION	Relatively stable ch position; Existing alder roots stabilize toe of bank
SA CK LB	S-1	30,868	30,792	76	RR BANK	NO-ACTION	RR bank in good condition
SA CK LB	A-1	30,792	30,700	92	CLASS A	NO-ACTION	Relatively stable ch position; Existing alder roots stabilize toe of bank; Site continues d/s from Town of Fairfax limits
FX CK RB	S-88	9,254	9,400	146	RUBBLE TOE WALL	NO-ACTION	Rubble toe wall continues past Town of Fairfax limits along outside bend ch position with numerous mature top of bank trees
FX CK RB	A-42	9,138	9,254	116	CLASS A	NO-ACTION	Stable inside bend ch position; d/s portion recommended for canopy enhancement
FX CK RB	S-87	9,130	9,138	8	VERT CONC WING WALL	NO-ACTION	Good condition
FX CK RB	S-86	9,097	9,130	33	CULVERT	NO-ACTION	White School private road crossing culvert; 8 ft-diam RCP culvert; May be a flood constriction; Dec-31-05 HWMs in vicinity not adequate to determine backwater effect

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	S-85	9,083	9,097	14	VERT CONC WING WALL	NO-ACTION	Good condition
FX CK RB	S-84	9,066	9,083	17	RR BANK	NO-ACTION	Stable, light class rip-rap wingwall extension
FX CK RB	B-14	8,997	9,066	69	CLASS B	NO-ACTION	Recent minor lower and mid-bank erosion and no vegetative cover; mature mid-bank bay trees; stable approx. 1H:1V slope in native A horizon materials; stabilization would meet sediment source reduction objective only
FX CK RB	S-83	8,953	8,997	44	RR BANK	NO-ACTION	Partially failed RR bank; Appears self-stabilized
FX CK RB	B-13	8,820	8,953	133	CLASS B	NO-ACTION	Recent minor lower and mid-bank erosion and no vegetative cover; mature mid-bank bay trees; sufficient ch width and gr bar at toe; stable approx. 1(H):1(V) slope in native clayey A horizon bank material; site stabilization would achieve sediment source site reduction objective only
FX CK RB	S-82	8,800	8,820	20	RR BANK	NO-ACTION	Light class RR bank; Stable; Note: recommended canopy enhancement site
FX CK RB	A-41	8,775	8,800	25	CLASS A	NO-ACTION	Stable ch position
FX CK RB	B*-14	8,722	8,775	53	CLASS B *	ACTION	Recent entire bank failure in 16-17 ft-high bank where vert timber ret wall rotated into ch; slump deposit in ch reduced bkf width to less than recommended design bkf width; Recommend constructing vegetated RR toe wall founded on shallow BR beneath slump deposit along new edge of ch alignment designed to re-establish minimum 15-16 ft-wide bkf ch and protect undercut trees at d/s end of site; TOB maples and fence threatened by future erosion or construction of gradually-sloped bank
FX CK RB	A-40	8,648	8,722	74	BR BANK/OC	NO-ACTION	Bedrock outcrop bank to bank in narrow steep BR riffle reach; numerous mid-bank trees above BR bank undercut by mid-bank erosion; very difficult to stabilize; undercut trees may be partially stabilized by stabilization of u/s RB site
FX CK RB	A-39	8,580	8,648	68	CLASS A	NO-ACTION	Stable ch position downstream from narrow BR bank/oc site;
FX CK RB	S-81	8,532	8,580	48	RR BANK	NO-ACTION	Stable 1/4-ton to 1/2-ton RR bank at 1.5(H):1(V) to 1.75(H):1(V) slope with gr bar toe and sandy FP deposit on bench; slightly inside bend ch position; Recommend canopy enhancement within rr bank structure as far as feasible
FX CK RB	B-12	8,507	8,532	25	CLASS B	NO-ACTION	Recent minor lower and mid-bank erosion; site stabilization would achieve sediment source site reduction objective only
FX CK RB	S-80	8,475	8,507	32	SACKRETE WALL	NO-ACTION	Good condition; concrete block and sackrete wall
FX CK RB	S-79	8,436	8,475	39	RR TOE WALL	NO-ACTION	Good condition; facing class RR toe wall

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	B-11	8,364	8,436	72	CLASS B	NO-ACTION	Bay tree stump at toe of bank and two mature bay trees at mid-bank undercut by chronic erosion at and below bkf depth; recommend cabling in place recently collapsed root structure as self-stabilizing toe protection for bay tree at toe; no canopy cover or TOB structures appear threatened; site stabilization would achieve sediment source site reduction objective only
FX CK RB	B-10	8,305	8,364	59	CLASS B	NO-ACTION	Recent minor bank erosion but no existing structures or mature canopy vegetation appear threatened; Site stabilization would achieve sediment source reduction objective only; May be possible to lay back bank from OHW to TOB, place geofabric and coir rolls along the finished toe of bank, etc.; RR toe protection does not appear necessary given ch position, ch width, and condition of bank toe material; topped bay tree forms u/s site boundary
FX CK RB	B-9	8,258	8,305	47	CLASS B	NO-ACTION	Lack of ground cover vegetation at low- and mid-bank; recent direct rainfall splash erosion and minor chronic bank erosion evident; relatively stable bank slope and ch position; low priority for stabilization
FX CK RB	S-78	8,216	8,258	42	RR BANK	NO-ACTION	Stable grouted facing class RR bank extending up to WSE + 6 ft; property 6 Shemran; owner Alice Seter; Existing LB 36 in-diam SD blasts u/s end of existing RR bank;
FX CK RB	S-77	8,081	8,216	135	VERT TIMBER RET WALL	NO-ACTION	Good condition; 2 ft-high vert timber ret wall
FX CK RB	A-38	8,009	8,081	72	CLASS A	NO-ACTION	Stable ch position u/s from 8 ft-diam SFD Blvd culvert inlet with dense vegetation, primarily willow covering banks
FX CK RB	S-76	8,000	8,009	9	VERT CONC WING WALL	NO-ACTION	Good condition
FX CK RB	S-75	8,000	7,847	153	CULVERT	ACTION	Sir Francis Drake Blvd culvert; 8 ft-diam CMP; existing polymer-coated CMP in d/s 23 ft-long section; culvert capacity less than Dec 31, 2005 flood; Dec 31, 2005 flood overtopped channel u/s from culvert HWM approx 1.5 ft depth on chain-link fence along sidewalk above headwall; Recommend removal and replacement with 12-16 ft-wide, 10-ft high open bottom arch culvert on reinforced concrete strip footings
FX CK RB	B*-13	7,847	7,826	21	CLASS B*	ACTION	FFX SITE; Sir Francis Drake Blvd culvert outlet repair site; Dec 31, 2005 flood return flows from SFD Blvd and pressure flow in culvert caused backfill to erode from the d/s most section of the 8 ft-diam culvert, and the culvert section to detach and transport downstream; Recommend either replacing the culvert section and placing RSP on headwall and wingwalls to blend to existing LB and RB RR banks; <i>See detailed project site description and design recommendations in report</i>
FX CK RB	S-74	7,826	7,779	47	RR BANK	NO-ACTION	Recommend removing weeping willow 202 ft downstream from SFD Blvd culvert outlet in flow line

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	A-37	7,779	7,719	60	CLASS A	NO-ACTION	Partial RR banks; Relatively stable
FX CK RB	S-73	7,719	7,703	16	RR BANK	NO-ACTION	Light class RR bank up to WSE + 5 ft
FX CK RB	A-36	7,703	7,672	31	CLASS A	NO-ACTION	Stable; poor understory vegetation; some ivy; Recommend planting native trees in understory
FX CK RB	S-72	7,672	7,592	80	RR BANK	NO-ACTION	Light class RR bank up to WSE + 9 ft encroached into ch 3-4 horiz ft; caused LB toe erosion d/s
FX CK RB	A-35	7,592	7,473	119	CLASS A	NO-ACTION	Stable; bank appears constructed of fill; canopy enhancement site
FX CK RB	A-34	7,473	7,131	343	CLASS A	NO-ACTION	Relatively stable; poor understory vegetation; high rainfall splash erosion; low slope; no structures; non-native mid-bank trees; recommend planting native trees in understory
FX CK RB	S-71	7,131	7,079	52	RR BANK	NO-ACTION	Light class RR bank up to WSE + 4 ft; bk ht = 5.5 ft
FX CK RB	A-33	7,079	6,948	131	CLASS A	NO-ACTION	Relatively stable ch position
FX CK RB	B-8	6,948	6,888	60	CLASS B	NO-ACTION	Minor bank erosion at 5 ft-high bank
FX CK RB	A-32	6,888	6,351	537	CLASS A	NO-ACTION	Relatively stable; minor toe scour prevents vegetation establishment; Olema Rd near TOB
FX CK RB	S-70	6,351	6,329	22	CULVERT	ACTION	Pvt driveway crossing; 5' high by 7' wide rectangular concrete box culvert; undersized culvert opening appears to produce flooding onto LB apt complex property and RB Olema Rd; Recommend removal and replacement with larger culvert or restored natural channel if room allows and a clear-span bridge deck crossing; Project design by Questa, Inc. underway
FX CK RB	S-69	6,329	6,209	120	RECT CONC CH	ACTION	7 ft wide by 5.5 ft high rect conc open ch; recommend removal and replacement with MSE or veg RR ch banks and clear-span bridge deck crossing
FX CK RB	S-68	6,209	6,204	5	CONC APRON	ACTION	Open rectangular concrete box culvert; 5.5 ft-high by 7 ft-wide; undersized culvert; Recommend removal and replacement with wider culvert or restored natural channel if room allows; width constrained reach; May be possible to replace channel with natural channel banks that would support riparian vegetation to reestablish canopy cover in reach; Project design by Questa Inc. underway
FX CK RB	A-31	6,204	5,996	208	CLASS A	NO-ACTION	Relatively stable; minor undercut banks are good habitat; bank stabilization including vegetated RR toe wall may be required if d/s Westbrae-Olema dam is partially lowered, notched, bank stabilization may be required as part of flood management and ch restoration project design underway by Questa, Inc.

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	B*-12	5,996	5,940	56	CLASS B*	ACTION	Near-vertical 5.5-ft-high bank along east edge of Olema Rd; sewer pipe exposed in bank; shallow bedrock likely present in subgrade toe; Recommend constructing vertical sheetpile wall along edge of road or at minimum vegetated RR toe along toe of bank, especially if d/s Westbrae-Olema Dam lowered, notched; Channel is very narrow with dense vegetation at LB; RR toe wall design should minimize encroachment into channel; Site stabilization may be required as part of flood management and ch restoration design underway by Questa, Inc.
FX CK RB	S-67	5,940	5,886	54	DAM	NO-ACTION	Westbrae-Olema Dam C/L at 2,102 ft d/s from SFD culvert inlet
FX CK RB	A-30	5,886	5,871	14	CLASS A	NO-ACTION	BR bank; near-vertical approx. 15 ft-high BR bank; stable
FX CK RB	S-66	5,871	5,852	19	CONC CRIBWALL	NO-ACTION	1(H):4(V) sloped conc crib wall up to WSE + 12 ft; good condition
FX CK RB	S-65	5,852	5,843	10	BRICK WALL	NO-ACTION	Near-vertical brick wall up to WSE + 8 ft; fair condition
FX CK RB	S-64	5,843	5,811	32	RUBBLE WALL	NO-ACTION	1(H):4(V) sloped grouted broken conc rubble wall up to WSE + 7 ft; fair condition
FX CK RB	A-29	5,811	5,715	97	CLASS A	NO-ACTION	Clayey-silty sand exposed in scoured bank toes; otherwise well vegetated
FX CK RB	B-7	5,715	5,631	83	CLASS B	NO-ACTION	Clayey-silty sand exposed in scoured bank toes; otherwise well vegetated; no canopy cover, mature trees, or structures threatened; site stabilization would achieve sediment source reduction objective only
FX CK RB	S-63	5,631	5,592	39	RR BANK	NO-ACTION	Rubble wall up to WSE + 4-5 ft, then increasing to WSE + 8 ft; bed dominated by coarse RR debris from failed RR structures
FX CK RB	A-28	5,592	5,514	78	CLASS A	NO-ACTION	Stable inside bend ch position; 15-16 ft-high bank appears composed of coarse rocky construction fill
FX CK RB	S-62	5,514	5,491	23	RR BANK	NO-ACTION	6 ft-high RR wall contains mix of It class and facing class RR, rubble
FX CK RB	A-27	5,491	5,474	17	CLASS A	NO-ACTION	Relatively stable reach with existing alder roots stabilizing bank toes; 1-2 vert ft historical incision
FX CK RB	S-61	5,474	5,416	57	SACKRETE WALL	NO-ACTION	U/s section: 1(H):4(V) sloped sackrete wall to WSE + 16 ft; D/s section: 1(H):4(V) to WSE + 8 ft, 1(H):1(V) to WSE + 16 ft
FX CK RB	S-60	5,416	5,329	87	RUBBLE WALL	NO-ACTION	6 ft-high stacked rubble wall
FX CK RB	S-59	5,329	5,263	66	RUBBLE WALL	NO-ACTION	7 ft-high stacked rubble wall also contains It class and facing class RR
FX CK RB	B-6	5,263	5,231	33	CLASS B	NO-ACTION	Approx. 1(H):1(V) sloped 16 ft-high bank with nr vert toe and lack of vegetation cover amongst numerous existing failed low vert timber ret wall structures on upper bank; Lack of canopy cover in reach; Recommend canopy enhancement on upper bank area by grading and topsoil placement within existing ret wall structures as far as feasible, placing geofabric, planting, and irrigation

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	S-58	5,231	5,187	44	TIRE WALL	NO-ACTION	3 ft-high tire wall; 5 ft-high rubble wall above; 8 ft-high exposure of A/Fill bank material at upper bank; lack of vegetation and canopy cover is limited in reach; Recommend canopy enhancement by grading, placing geofabric, planting, and irrigation on upper bank area
FX CK RB	A-26	5,187	5,005	182	CLASS A	NO-ACTION	Stable, well vegetated bank
FX CK RB	B-5	5,005	4,973	33	CLASS B	NO-ACTION	Frequent minor bank erosion up to WSE + 8 ft; site stabilization would achieve sediment source reduction objective only
FX CK RB	A-25	4,973	4,865	108	CLASS A	NO-ACTION	Stable, well vegetated bank
FX CK RB	B*-11	4,865	4,831	34	CLASS B*	ACTION	Recent bank failure in approx. 1(H):1(V) sloped 14 ft-high bank with low density clay exposed in toe of bank; wide expanse of bare soil; fence and house foundation close to TOB; existing alders reinforce toe of bank only in u/s half of site; Recommend stabilization of d/s half of site from d/s end of alder roots exposed in bank toe to sewer pipe xing abutment; Recommend install approx. 10 ft-long vegetated RR toe wall at max 1(H):1(V) slope from below th grade up to WSE + 3-4 ft; grade upper bank above new RR toe wall to max 1.25(H):1(V) slope and/or move fence as necessary, place geofabric and plant graded upper bank; This is a recommended canopy enhancement site; Plant existing root toe in u/s half of site with willow and alder and/or live willow wall; live willow brush mattress could work at site in place of vegetated RR toe wall only if fence can be moved back from existing TOB
FX CK RB	S-57	4,831	4,813	18	RUBBLE BANK	NO-ACTION	Stacked rubble bank up to WSE + 5 ft with vert timber ret wall above; keep existing vert timber ret wall as part of u/s recommended site repair
FX CK RB	C-3	4,813	4,799	14	CLASS C	NO-ACTION	Approx. 24 in-diam oak undermined by long-term bank toe erosion; at relatively protected ch bank position between d/s RR bank and u/s rubble bank; oak provides only minor component of reach canopy cover
FX CK RB	S-56	4,799	4,715	84	RR BANK	NO-ACTION	Very stable (overbuilt) 1/4-ton RR bank up to WSE + 11 ft; encroached into channel approx. 6-8 horiz ft and causes comparable d/s bank toe erosion at LB sites below SFD Blvd ROW; 1/2- to 1-ton RR pieces form bar at toe of wall and contributes to LB erosion d/s; structure's encroachment also appears to contribute to d/s RB bank failure
FX CK RB	A-24	4,715	4,673	42	CLASS A	NO-ACTION	Stable, well vegetated bank in protected ch position d/s from encroached RR bank

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	B*-10	4,673	4,629	44	CLASS B*	ACTION	Recent severe bank slump failure in 15 ft-high bank; failure deposit forms 20 ft-wide self-stabilized bench covering coarse RR bar deposit in ch from bank failure; Coarse material in failure forcing erosion at LB d/s; Recommend pulling some of the RR pieces back min 3-5 horiz ft from the ch to form a new design toe of bank line; Also recommend constructing vegetated RR toe wall or mixed RR and live willow toe wall up to WSE + 5 ft and MSE soil lifts to reconstruct upper 10 ft of bank to max 1.5(H):1(V) slope, placing geofabric, and planting upper slope; Plant willow and alder in clean sand and gravel placed amongst RR pieces comprising the self-stabilized bar along the toe of the finished bank; Existing dead alder snag forms d/s end of site; Recommend cutting dead tree down to the stump to stabilize existing stump and roots to serve as d/s key for design structure
FX CK RB	B-4	4,629	4,575	55	CLASS B	ACTION	Relatively stable, protected inside bend ch position d/s from existing alder snag; Recommend grading back self-stabilized coarse RR bench deposit min 3-4 ft to reduce erosion pressure on LB d/s; Recommend installing live willow wall or vegetated geofabric-covered toe at max 1.5(H):1(V) slope, and repairing upslope bank failure by grading to max 1.5(H):1(V) with MSE soil lifts then placing geofabric, and irrigated plantings; Site is candidate for live willow brush mattress with partial RR toe protection using selected pieces of self-stabilized bench in ch
FX CK RB	B-3	4,575	4,525	49	CLASS B	ACTION	Relatively stable portion of problem reach caused by poorly designed LB storm drain outlet that blasts the RB; Recommend stabilization of entire reach by installation of vert sheetpile wall up to WSE + 16 ft to widen the channel and reduce continuing erosion pressure on LB and RB; Sheetpile wall would allow for the LB SD outlet to continue to scour a deep pool at the toe of the LB; Recommend planting alders along toe of constructed gr and cobble bars along toe of sheetpile wall u/s and d/s from existing scour pool; Canopy enhancement needed in this reach; Recommended to plant TOB above finished wall either as part of bank stabilization project or alone
FX CK RB	B*-9	4,525	4,502	24	CLASS B*	ACTION	Near-vertical 16 ft-high bank failure above deep scour pool caused by poorly designed LB storm drain outlet that blasts the RB during floods; Existing fence at TOB; Lack of canopy in reach; If this bank failure is treated alone without recommended reach-scale vert sheet pile treatment, then recommend vert sheet pile or 1(H):3(V) vegetated 1/4-ton to 1/2-ton RR bank toed down to WSE - 6 ft to allow for existing scour pool to restore; Fence would need to move back min 4-8 ft horiz ft from TOB to accommodate RR bank instead of vert sheetpile wall

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	A-23	4,502	4,478	24	CLASS A	NO-ACTION	Stable inside bend ch position with fine sed deposition on fp bar; if u/s site treatment by vert sheetpile wall then extend wall d/s through d/s inside bend fp bar to existing non-native pine approx. 9 ft u/s from d/s end of d/s gabion wall
FX CK RB	S-55	4,478	4,429	49	GABION WALL	NO-ACTION	Gabion wall up to WSE + 8 ft; alder roots reinforce toe of bank along d/s portion of wall
FX CK RB	A-22	4,429	4,398	31	CLASS A	NO-ACTION	Stable inside bend ch position with bar and fine sed deposition and mature vegetation
FX CK RB	S-54	4,398	4,333	65	GABION WALL	NO-ACTION	Gabion wall up to WSE + 15 ft
FX CK RB	B*-8	4,333	4,312	21	CLASS B*	ACTION	Failed 8 ft-high d/s portion of u/s 15 ft-high gabion wall; Recommend removal of failed gabion baskets and replacement with vegetated 1/4-ton to 1/2-ton RR toe wall extending down to WSE - 3 ft and up to WSE + 5 ft and construction of vegetated, fabric-covered MSE upper bank at max 1.25(H):1(V) slope above RR toe wall
FX CK RB	A-21	4,312	4,275	37	CLASS A	ACTION	Relatively stable inside bend ch position with some minor bank toe erosion amongst misc rubble toe wall protection along u/s end of inside bend; TOB non-native trees form existing canopy cover in this reach; Future bank failure likely at site; If bank can be graded back beyond the existing TOB and TOB non-native trees removed, then recommend bank stabilization and canopy enhancement project; Recommend grading back bank from OHW to TOB at max 1.5(H):1(V) slope and installing vegetated geofabric erosion control
FX CK RB	A-20	4,275	4,193	82	CLASS A	NO-ACTION	Stable inside bend ch position with wide sandy floodplain unit; Note: recommended canopy enhancement site
FX CK RB	S-53	4,193	4,093	99	VERT CONC RET WALL	NO-ACTION	Good Condition, up to WSE + 11 ft
FX CK RB	S-52	4,093	4,065	28	CULVERT	NO-ACTION	Marin Rd Bridge culvert; 26 ft-wide 8 ft-high elliptical arch culvert on concrete strip footings with natural bottom; LB gr bar up to WSE + 1 ft; approx. 6-8 ft-wide ineffective flow area at LB edge of culvert at inlet; approx. 3 ft-wide ineffective flow area at LB edge at outlet; existing alder 10 ft d/s from outlet does not appear to constrain flow conveyance capacity of culvert; high water marks not adequate to determine if culvert caused overbank flow during the December 31, 2005 flood
FX CK RB	S-51	4,065	4,055	10	VERT CONC WING WALL	NO-ACTION	Good Condition, up to WSE + 11 ft
FX CK RB	S-50	4,055	3,950	105	VERT CONC RET WALL	NO-ACTION	Good Condition, up to WSE + 11 ft
FX CK RB	S-49	3,950	3,940	11	VERT TIMBER RET WALL	NO-ACTION	Good Condition, up to WSE + 10 ft
FX CK RB	S-48	3,940	3,837	103	VERT CONC RET WALL	NO-ACTION	Good Condition, up to WSE + 12 ft

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	S-47	3,837	3,820	17	VERT CONC RET WALL	NO-ACTION	Good Condition, up to WSE + 8 ft
FX CK RB	A-19	3,820	3,736	84	CLASS A	ACTION	(1 of 5) Relatively stable ch position in straight but very narrow ch reach along LB vert conc ret wall; with existing alder root stabilized bank toe and numerous mature TOB trees; RB upper bank material dominated by random landfill and failing in places; Recommend grading upper bank back to remove landfill materials and stabilize finished upper bank with vegetated geofabric erosion control; Recommend action as far as feasible without damaging existing TOB trees; medium priority project
FX CK RB	S-46	3,736	3,732	5	RR BANK	ACTION	(2 of 5) Fair condition; up to WSE + 7 ft; Very narrow ch reach; If TOB fence can be moved and TOB can be graded back several horiz ft, then recommend remove RR bank wall materials and replace with a constructed fp bench at approx. WSE + 2-3 ft, a 1(H):1(V) sloped vegetated RR bank set back at the edge of the fp bench and extending up to FP + 4 ft; and a vegetated geofabric covered upper bank graded to max 1(H):1(V) slope up to RR bank + 4 ft; medium priority project
FX CK RB	S-45	3,732	3,706	26	VERT TIMBER RET WALL	ACTION	(3 of 5) Vert timber ret wall in poor condition and failing in d/s section; Very narrow ch reach; Existing alder roots stabilize base of wall; If TOB fence and TOB can be graded back several horiz feet, then recommend removing failing wall and wall backfill and replacing with a constructed FP bench at WSE + 2-3 ft, a 1(H):1(V) sloped vegetated RR BANK set back at the edge of the FP bench up to FP + 4 ft; and a vegetated geofabric covered upper bank graded to max 1(H):1(V) slope up to RR bank + 4 ft; medium priority project
FX CK RB	S-44	3,706	3,688	17	RUBBLE WALL	ACTION	(4 of 5) Stacked broken conc rubble wall in poor condition; lack of vegetation cover; If TOB fence and TOB can be graded back several horiz feet, then recommend removing failing wall and wall backfill and replacing with a constructed FP bench at WSE + 2-3 ft, a 1(H):1(V) sloped vegetated RR BANK set back at the edge of the FP bench up to FP + 4 ft; and a vegetated geofabric covered upper bank graded to max 1(H):1(V) slope up to RR bank + 4 ft; medium priority project

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	A-18	3,688	3,620	68	CLASS A	ACTION	(5 of 5) Stable inside bend ch position with fine sediment deposition on existing FP bar; If TOB fence and TOB can be graded back several horis feet, then recommend removing failing wall and wall backfill and replacing with a constructed FP bench at WSE + 2-3 ft, a 1(H):1(V) sloped vegetated RR BANK set back at the edge of the FP bench up to FP + 4 ft; and a vegetated geofabric covered upper bank graded to max 1(H):1(V) slope up to RR bank + 4 ft; Site terminates at existing alder tree at the toe of bank at d/s end of site; Project would allow flood flows to "cut off" tortuous narrow ch bend, reduce shear stress and erosion pressure on both banks, and improve flood flow conveyance through reach; medium priority project
FX CK RB	A-17	3,620	3,518	103	CLASS A	NO-ACTION	Stable inside bend transitioning to straight ch position; Existing alder tree roots stabilize toe of bank along most of site; numerous mature mid-bank and TOB trees; some miscellaneous It class and facing class RR placed along toe of bank in reach
FX CK RB	S-43	3,518	3,503	14	RUBBLE TOE WALL	NO-ACTION	Good condition, up to WSE + 4 ft
FX CK RB	A-16	3,503	3,492	12	CLASS A	NO-ACTION	Relatively stable straight ch position; stable alder root toe along most of reach; numerous mature mid- and top of bank trees;
FX CK RB	S-42	3,492	3,445	47	VERT TIMBER RET WALL	NO-ACTION	Poor condition; to WSE + 10 ft; would recommend removal; but improvement would mainly be aesthetic; good canopy and adequate ch width in reach;
FX CK RB	C-2	3,445	3,415	30	CLASS C	ACTION	Completely failed 23 ft-long d/s section of vert timber ret wall comprises stability of a partially undermined monumental oak tree nr TOB (at approx. WSE + 10-12 ft) rooted at d/s end of original wall; Recommend saving tree by placement of 3-4 pieces of 1/4-ton to 1/2-ton RR and possibly a LWD rootwad to promote intentional scour pool immediately d/s from oak; Also recommend removal of mature alder tree at inside bend ch position along toe of LB 23 ft u/s from oak
FX CK RB	S-41	3,415	3,366	49	VERT TIMBER RET WALL	NO-ACTION	Good condition; up to WSE + 10 ft
FX CK RB	S-40	3,366	3,357	9	VERT CONC WING WALL	NO-ACTION	Good condition; Angled 45 degrees to Olema Rd culvert headwall
FX CK RB	S-39	3,357	3,321	36	CULVERT	NO-ACTION	Olema Road Bridge culvert; 13.7 ft-wide by 9.7 ft-high concrete rectangular box culvert approx. at grade; 10 in-diam cast iron sewer pipe reduces effective ht of opening to approx. WSE + 8 ft near d/s end of culvert; RB weeping willow d/s from outlet recommended for removal due to evidence of debris blockage; Modifying or replacing u/s wingwalls may reduce culvert entrance losses; Analysis required to identify and prioritize flood management objectives and design solutions

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	S-38	3,321	3,289	32	VERT CONC WING WALL	NO-ACTION	Good condition
FX CK RB	S-37	3,289	3,257	32	RUBBLE TOE WALL	NO-ACTION	Good condition
FX CK RB	A-15	3,257	3,248	9	CLASS A	NO-ACTION	Stable straight ch position; alder roots stabilize toe of bank
FX CK RB	S-36	3,248	3,234	14	PVT DRV BDGE	NO-ACTION	Private driveway bridge; 19 ft-wide, 11 ft-high area between piers effective; bank areas ineffective; does not appear to be a constriction
FX CK RB	A-14	3,234	3,203	31	CLASS A	NO-ACTION	Stable straight ch position; alder roots stabilize toe of bank
FX CK RB	S-35	3,203	3,168	35	RUBBLE WALL	NO-ACTION	Dry stacked 1(H):4(V) sloped rubble wall to WSE + 9 ft in fair to good condition; recent minor erosion at d/s end of rubble wall; probably will ultimately cause wall to fail; Reach is relatively stable; Note: upper bank area above wall is recommended canopy enhancement site
FX CK RB	A-13	3,168	3,146	22	CLASS A	NO-ACTION	Relatively stable ch position at u/s end of inside bend reach; some minor bank erosion as would be expected at u/s end of bend; good canopy cover in reach
FX CK RB	S-34	3,146	3,130	16	RR TOE WALL	NO-ACTION	Stacked and grouted 1(H):4(V) rubble wall up to WSE + 3 ft in fair to good condition
FX CK RB	A-12	3,130	3,022	108	CLASS A	NO-ACTION	Stable inside bend ch position
FX CK RB	S-33	3,022	2,997	25	RUBBLE WALL	NO-ACTION	Dry-stacked 1(H):4(V) rubble wall up to WSE + 8 ft in fair to good condition; wall protects monumental oak tree at TOB
FX CK RB	A-11	2,997	2,984	14	CLASS A	NO-ACTION	Near-vertical 7 ft-high ch bank in stable ch position protected between u/s and d/s rubble walls
FX CK RB	S-32	2,984	2,963	20	RUBBLE WALL	NO-ACTION	Dry-stacked 1(H):4(V) rubble wall up to WSE + 7 ft in fair to good condition
FX CK RB	A-10	2,963	2,953	10	CLASS A	NO-ACTION	Relatively stable, straight ch position protected between u/s and d/s rubble walls
FX CK RB	S-31	2,953	2,937	16	RUBBLE WALL	NO-ACTION	Dry-stacked 1(H):4(V) rubble wall up to WSE + 4 ft in fair to good condition
FX CK RB	S-30	2,937	2,910	27	SHOTCRETE BANK	NO-ACTION	Good condition
FX CK RB	B-2	2,910	2,815	96	CLASS B	NO-ACTION	Minor bank erosion along toe and mid-bank appears adjustment to high velocity flows from surface of u/s shotcrete bank; Appears somewhat self-stabilized; Some minor erosion likely to continue in same mode but stabilizing site is a low priority
FX CK RB	A-9	2,815	2,773	42	CLASS A	NO-ACTION	Relatively stable straight ch position; existing cottonwood trees line toe of bank

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	B*-7	2,773	2,691	82	CLASS B*	ACTION	Rapidly eroding outside bend ch position along 9 ft-high bank where outside bend bank erosion will eventually "cut off" bend and improve flood conveyance and bank stability throughout reach; Canopy cover very poor in reach as unstable ch banks prevent establishment of mature riparian vegetation and TOB mature riparian trees are dominated by nearly senescent Lombardy poplars; Recommend reach-scale project to manually speed up both the natural erosion process and restoration of canopy cover in the reach, as well as improve flood flow conveyance conditions u/s from d/s Scenic Rd culvert; Recommend grading back the bank through the bend approx. 40 horiz ft to create a 1-2 ft-high gr bar and a 2-3 ft-high fp bench in place of the 9 ft-high banks; Grade the finished 8-9 ft-high 1.5(H):1(V) sloped finished bank with slight inside bend topography to preserve shear protection for d/s wall units; Stabilize the finished 8-9 ft-high 1.5(H):1(V) bank with vegetated geofabric; heavily vegetate toe of bank on new fp bench with willow and alder; May be possible to install live willow brush mattress for lower portion of finished bank along edge of new fp bench
FX CK RB	S-29	2,691	2,603	88	RR TOE WALL	NO-ACTION	Existing non-native Lombardy poplars line TOB along reach down to Scenic Rd Bdge
FX CK RB	S-28	2,603	2,594	9	VERT CONC WING WALL	NO-ACTION	Good condition
FX CK RB	S-27	2,594	2,555	39	CULVERT	NO-ACTION	Scenic Road Bridge culvert; 14 ft-wide by 11 ft-high concrete box culvert; left 3 ft ineffective; top 3 ft partially ineffective; u/s RB wingwall only 20 degrees from face; Lombardy Poplars at LB TOB block entrance to culvert and should be removed either alone or as part of bank regrading project to decrease culvert entrance losses; d/s RB and LB wingwalls either failing or poorly designed; Recommend replacing both with new vertical wingwalls angled $\tan^{-1}(3)$ from face
FX CK RB	S-26	2,555	2,445	110	VERT CONC WING WALL	NO-ACTION	Poor design; to WSE + 9 ft
FX CK RB	S-25	2,445	2,329	116	VERT CONC WING WALL	NO-ACTION	Good condition; to WSE + 10 ft
FX CK RB	S-24	2,329	2,319	10	BDGE	NO-ACTION	Private driveway clear-span bridge deck crossing; Spans between vert conc ret walls at both banks with natural bottom; 17 ft-wide by 8.5 ft-high; Bridge deck appears to somewhat reduce flood conveyance capacity of the vert conc ret wall confined reach u/s but does not appear to be a severe flood constriction; no high water mark evidence near site to determine effect of bridge deck on flood WSE profile during Dec 31, 2005 flood
FX CK RB	S-23	2,319	2,310	9	VERT CONC WING WALL	NO-ACTION	Good condition; to WSE + 10 ft; same wall as u/s
FX CK RB	S-22	2,310	2,294	17	RR BANK	NO-ACTION	Good condition; 1/2 to 1-ton RR bank

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	A-8	2,294	2,218	75	CLASS A	ACTION	Existing alder roots stabilize toe of bank; Relatively stable 1(H):1(V) sloped bank in native soil and random fill material exposed up to Arroyo Avenue road bed; Existing bankfull ch width appears adequate in reach; Bank modification recommended at this site if it is determined that it would reduce entrance losses and maximize flood flow conveyance capacity of existing d/s Azalea Road bridge culvert
FX CK RB	S-21	2,218	2,175	43	CULVERT	ACTION	Azalea Road Bridge culvert; 15.2 ft-wide by 8.5 ft-high natural bottom rect conc culvert; 2.5 ft-wide section at edge of RB wall appears ineffective; 40 degree bend at entrance to culvert; To maximize flood flow conveyance capacity of the existing culvert, reduce entrance losses and ineffective width within the culvert by laying back RB over 120 ft-long reach upstream from the inlet and replace with vert conc ret wall with wing wall section aligned to form 3:1 width transition to culvert inlet as may be constrained to match existing at TOB Arroyo Avenue roadbed; More detailed hydraulic analysis is required to determine if these actions would be sufficient to achieve tbd flood management objective for the crossing; Complete culvert removal and replacement may be required to provide sufficient flood flow conveyance through crossing
FX CK RB	S-20	2,175	2,025	150	VERT CONC RET WALL	NO-ACTION	Good condition; to WSE + 10 ft
FX CK RB	A-7	2,025	2,017	9	CLASS A	NO-ACTION	Existing alder tree roots stabilize toe of bank
FX CK RB	S-19	2,017	2,001	16	RUBBLE WALL	NO-ACTION	Failed grouted rubble wall
FX CK RB	A-6	2,001	1,953	48	CLASS A	NO-ACTION	Existing alder tree roots stabilize toe of bank; Relatively stable 1(H):1(V) sloped bank exposing in native soil mixed with random fill material up to Arroyo Avenue road bed; Existing bankfull ch width appears adequate in reach;
FX CK RB	S-18	1,953	1,880	73	VERT CONC RET WALL	NO-ACTION	Good condition; up to WSE + 4 ft; Note: Arroyo Avenue roadbed is approx. 6 ft above top of wall

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	S-17	1,880	1,840	40	CULVERT	NO-ACTION	Spruce St Bridge culvert; 17.6 ft-wide by 10.3 ft-high natural bottom rectangular concrete box culvert; 3.5 ft-wide ineffective along LB edge of culvert caused by culvert's 40 degree turn to left and trees situated within flow path immediately upstream from inlet; BR outcrop in bed of channel along LB and in toe of LB bar within inlet the through length of culvert; To maximize flood flow conveyance of the existing Spruce St culvert, recommend remove u/s-most of two u/s alder trees to reduce entrance losses; d/s exit conditions do not appear limiting, although RB d/s from culvert outlet is slightly within flow path; Bank stabilization projects are recommended at both LB and RB downstream from culvert which should be designed to lay back not encroach into the channel to maximize flow conveyance through culvert
FX CK RB	B*-6	1,840	1,756	84	CLASS B*	ACTION	Difficult site; nr-vert 13-14 ft-high bank with frequent minor erosion and numerous TOB trees (mix of natives and non-natives); projects slightly into flow exit path of Spruce St culvert; shallow BR likely given BR OC at LB; Recommend laying back bank to stable slope or replace bank with vert conc ret wall set back 6-8 ft to allow for min 18 ft bkf width in reach; Design for site needs to be part of comprehensive reach-scale channel and riparian canopy enhancement and flood management improvement project, including LB and RB from Spruce St to Merwin Ave
FX CK RB	C-1	1,756	1,745	11	CLASS C	ACTION	Difficult site; Existing ash trees threatened by low- and mid-bank erosion along 13-14 ft-high nr-vert bank; placing RR on bank to reinforce threatened trees would make the reach too narrow and cause erosion d/s at LB; Removing trees would make bank unstable u/s and d/s; recommend tree removal only if part of comprehensive reach-scale channel and riparian canopy enhancement and flood management improvement project; project would improve flood flow conveyance in reach and reduce exit losses from Spruce St culvert
FX CK RB	B*-5	1,745	1,671	74	CLASS B*	ACTION	Difficult site; nr-vert 13-14 ft-high bank with frequent minor erosion and numerous TOB trees (mix of natives and non-natives); large recent complete bank failure in site; fence at TOB; Recommend laying back bank to stable slope or replace bank with vert conc ret wall set back 6-8 ft to allow for min 18 ft bkf width in reach; Site design needs to be part of comprehensive reach-scale channel and riparian canopy enhancement and flood management improvement project, including LB and RB from Spruce St to Merwin Ave

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FX CK RB	B-1	1,671	1,637	34	CLASS B	ACTION	Relatively stable inside bend ch position with high sandy bar in backwater effect of Merwin Ave Culvert; Recommend laying back bank to improve flood conveyance in reach between Spruce St and Merwin Ave; Needs to be part of comprehensive reach-scale ch and riparian canopy enhancement and flood management improvement project addressing both LB and RB from Merwin Ave to Spruce St; Recommended removal and replacement of Merwin Ave culvert would also affect design recommendations for site
FX CK RB	S-16	1,637	1,608	28	SACKRETE WALL	ACTION	Good condition; Recommend removal and replacement with vegetated bank protection as part of recommended Merwin Ave culvert removal and replacement project
FX CK RB	S-15	1,608	1,578	30	GABION WALL	ACTION	Vert custom-built gabion wall blocks entrance to Merwin Ave culvert; Recommend removal and replacement with vegetated restored ch bank as part of recommended Merwin Ave culvert removal and replacement project
FX CK RB	S-14	1,578	1,543	35	CULVERT	ACTION	Merwin Ave Bridge culvert; 18 ft-wide by 6.5 ft-high natural bottom rectangular concrete box culvert; extremely high entrance and exit losses caused by sinuous ch planform u/s and d/s; Recommend removal and replacement of structure with new planform and replacement and/or modification of existing bank stabilization structures to provide for minimum 18-ft-width throughout reach-scale site; Replacement has ramifications for sites u/s to Spruce St; Recommend all LB and RB sites between Town of Fairfax Peri Park and Spruce St be combined into one comprehensive reach-scale channel and riparian canopy enhancement and flood management improvement project
FX CK RB	S-13	1,543	1,460	83	GABION WALL	ACTION	Modify structure as necessary per reach-scale design for recommended Merwin Ave culvert removal and replacement project
FX CK RB	S-12	1,460	1,431	29	VERT CONC RET WALL	ACTION	Structure appears relatively new and in good condition; Appears to encroach into the channel min 3-4 ft; Structure increases flow velocities at LB d/s where there is a large recent bank failure site; Recommend removal or modification of structure as necessary per recommended Merwin Ave culvert removal and replacement project; Arguably, the deflection caused by the structure also increased the angle of flow attack at the upstream end of the Peri Park Tennis Courts, contributing to the recently accelerated bank failure at that site
FX CK RB	A-5	1,431	1,393	38	CLASS A	NO-ACTION	Relatively stable inside bend ch position; gr bar at toe
FX CK RB	S-11	1,393	1,331	62	RUBBLE WALL	NO-ACTION	Grouted wall in good condition; large slowly-decaying stump forms d/s end of wall

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	B*-4	1,331	1,232	99	CLASS B*	ACTION	FFX SITE; Recently accelerated bank erosion along outside bend ch position with edge of Peri Park tennis courts at TOB; Recommend either 1(H):3(V) sloped 1/2-ton to 1-ton vegetated RR wall keyed into existing clay toe to WSE -4 ft and extending up to TOB to WSE + 9-10 ft; or 9-10 ft-high vert conc ret wall or vert sheetpile wall; Recommend maintaining min 18-ft bkf ch width in reach; Appears there may not be adequate width to allow for encroachment by steep vegetated RR WALL; Also recommended to consider benefits of reducing erosion pressure on RB by constructing restored fp on LB site, leaving existing LB TOB trees in place on "island" between existing ch and proposed LB fp surface at WSE + 2.5-3.5 ft; Geotechnical analysis may be required to assess the stability of the tennis courts under existing and proposed design conditions; <i>See detailed site description and design recommendations in report</i>
FX CK RB	B*-3	1,232	1,200	32	CLASS B*	ACTION	FFX SITE; Peri Park pedestrian footbridge replacement and bank repair site; Recommend to remove stacked rubble near d/s end of tennis courts; Recommend replace bridge with pre-fab clear-span bridge deck structure with min abutment-to-abutment inside dimension of 18 ft; Recommend grading and stabilizing banks u/s and d/s from RB abutment with vegetated geofabric; d/s end of site is partially undermined and flood damaged bay tree; Recommend placing LWD cable-anchored to 2-3 1/2-ton RR pieces at toe of bay tree to stabilize d/s end of site and undermined bay tree; Downstream from site a comprehensive reach-scale design is required for entire Peri Park reach to address continuing bank erosion and tree failures; If a comprehensive site project is contemplated, it may affect the design recommendations for the Footbridge Site, especially how the d/s end of the bank stabilization at the RB; <i>See detailed site description and design recommendations in report</i>
FX CK RB	A-4	1,200	1,051	149	CLASS A	NO-ACTION	Relatively stable inside bend ch position with gr bar at toe around long sinuous bend; Recommendation may vary depending on whether or not a comprehensive site-scale channel stabilization project is contemplated
FX CK RB	B*-2	1,051	1,034	17	CLASS B*	ACTION	Redwood tree recently fallen into creek from former TOB at eroding outside bend ch position; Recommend leaving tree in place, and packing 1/4-ton to 1/2-ton RR behind root ball; backfilling RR with layers of native soil and geofabric layering; cable-anchoring base of fallen tree log to 1-ton RR pieces placed u/s and d/s from base of log; Recommendation may vary depending on whether or not a comprehensive site-scale channel stabilization project is contemplated for site
FX CK RB	A-3	1,034	884	149	CLASS A	NO-ACTION	Stable inside bend ch position with wide gr bar in sinuous reach; Recommendation may vary depending on whether or not a comprehensive site-scale channel stabilization project is contemplated;

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK RB	S-10	884	877	8	RR TOE WALL	NO-ACTION	Lt class RR toe wall at 1(H):4(V) slope up to WSE + 4 ft; Recommendation may vary depending on whether or not a comprehensive site-scale channel stabilization project is contemplated, including whether or not d/s Fairfax-Bolinas Rd culvert is to be removed and replaced
FX CK RB	S-9	877	869	8	VERT CONC RET WALL	NO-ACTION	Abutment carries utility line; Recommendation may vary depending on whether or not a comprehensive site-scale channel stabilization project is contemplated, including whether or not d/s Fairfax-Bolinas Rd culvert is to be removed and replaced
FX CK RB	B*-1	869	836	32	CLASS B*	NO-ACTION	Difficult site; Poorly vegetated approx. 10 ft-high bank at 1(H):2(V) slope from toe of bank up to TOB fence where there are recent playground improvements; toe of bank is undercut everywhere below bcf depth and roots exposed; reasonable number of mid-bank and upper bank trees stabilize bank; if project were undertaken for the overall park site the recommendation would likely be to stabilize this bank as far as feasible using bioengineering methods including soil lifts covered by vegetated geofabric, and/or limited rock rip-rap used to anchor LWD pieces to focus flow energy toward ch C/L and away from eroded toe of bank; Recommendation would vary depending on overall park site plan, and whether or not the d/s undersized culvert were to be replaced; the d/s reach is too narrow, and culvert replacement would likely include widening of the d/s reach and replacement of poorly designed vertical bank protection at both LB and RB, the design of which would affect design for this site; Laying back the TOB 4-6 horiz ft and moving the fence this distance would be helpful in the event of an overall u/s site plan and/or d/s culvert replacement
FX CK RB	S-8	836	814	22	RUBBLE BANK	NO-ACTION	Poor condition; Reach is very narrow; Recommend removal and replacement of structure with natural channel if Fairfax-Bolinas Culvert is replaced
FX CK RB	S-7	814	762	52	VERT TIMBER RET WALL	NO-ACTION	Fair condition; Reach is very narrow; Flood conveyance limited in this reach by backwater effect from d/s Bolinas-Fairfax Rd culvert; Recommend removal and replacement of structure with natural channel if Fairfax-Bolinas Culvert is replaced
FX CK RB	S-6	762	681	81	RUBBLE BANK	NO-ACTION	Fair condition; Reach is very narrow; Flood conveyance limited in this reach by backwater effect from d/s Bolinas-Fairfax Rd culvert; Recommend removal and replacement of structure with natural channel if Fairfax-Bolinas Culvert is replaced
FX CK RB	A-2	681	665	16	CLASS A	NO-ACTION	Relatively stable natural channel bank section in channelized reach through Town of Fairfax property; Reach is very narrow; Flood conveyance limited in this reach by backwater effect from d/s Bolinas-Fairfax Rd culvert; Recommend grading and stabilization of natural bank section if Fairfax-Bolinas Culvert is replaced

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/ Structure Class	Recommend Action/ No-Action	Site/Structure Description
FX CK RB	S-5	665	643	22	VERT CONC RET WALL	NO-ACTION	Reach is very narrow; Flood conveyance limited in this reach by backwater effect from d/s Bolinas-Fairfax Rd culvert; Recommend removal and replacement of structure with natural channel if Fairfax-Bolinas Culvert is replaced
FX CK RB	S-4	643	635	8	VERT CONC WING WALL	NO-ACTION	Reach is very narrow; Flood conveyance limited in this reach by backwater effect from d/s Bolinas-Fairfax Rd culvert;
FX CK RB	S-3	635	609	26	CONC BOX CULVERT	NO-ACTION	Reach is very narrow; Flood conveyance limited in this reach by backwater effect from d/s Bolinas-Fairfax Rd culvert;
FX CK RB	S-2	609	500	109	VERT CONC RET WALL	NO-ACTION	Reach is very narrow; Flood conveyance limited in this reach by backwater effect from d/s Bolinas-Fairfax Rd culvert;
FX CK RB	S-1	500	20	480	CULVERT	ACTION	Bolinas-Fairfax Rd culvert; rectangular concrete box culvert; inlet dimensions assumed same as outlet dimensions (10 ft-wide by 6 ft-high); Culvert is severe flood constriction; Recommend removal of culvert and replacement with larger culvert, natural channel restoration, or hybrid natural channel restoration and vertical sheetpile walls; Existing culvert is overlain by public and private housing, utilities, and infrastructure; Removal and replacement is an expensive complicated project; Apparently no feasibility study has been completed to date
FX CK RB	A-1	20	0	20	CLASS A	NO-ACTION	Bolinas-Fairfax Rd culvert; rectangular concrete box culvert; outlet dimensions measured 10 ft-wide by 6 ft-high; outlet invert perched approx. 3 ft above plunge pool WSE below; Approx. 20 ft-long stable reach d/s from culvert to confluence with San Anselmo Ck; 20 ft-long reach is stable and is within active channel of San Anselmo Ck
FX CK LB	A-41	9,138	9,400	262	CLASS A	NO-ACTION	Relatively stable ch position with minor bank toe erosion in reach; bank slope more gradual than 1(H):1(V); mature trees at top of bank; and recent riparian vegetation plantings on bank and LB fp; continue LB fp and no action upstream from Town of Fairfax limits.
FX CK LB	S-65	9,130	9,138	8	VERT CONC U/S WINGWALL	NO-ACTION	Good condition
FX CK LB	S-64	9,096	9,130	34	CULVERT	NO-ACTION	White School private road crossing culvert; 8 ft-diam RCP culvert; May be a flood constriction; Dec-31-05 HWMs in vicinity not adequate to determine backwater effect
FX CK LB	S-63	9,083	9,096	13	VERT CONC D/S WINGWALL	NO-ACTION	Good condition
FX CK LB	S-62	9,066	9,083	17	RR TOE WALL	NO-ACTION	Good condition; wingwall extension

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	B-25	9,045	9,066	21	CLASS B	NO-ACTION	Frequent minor bank erosion downstream from culvert outlet and wingwall extension; site ends at existing buckeye tree root toe; Appears self-stabilizing; Cabled RR-LWD toe protection would reduce erosion
FX CK LB	A-40	8,936	9,045	109	CLASS A	NO-ACTION	Relatively stable ch position
FX CK LB	B-24	8,830	8,936	106	CLASS B	NO-ACTION	Frequent minor bank erosion threatens mature riparian tree canopy; possible failure of trees unlikely to cause debris jam in reach; tree failure would likely self-stabilize site; clay exposed in toe of bank at upstream end of site; Cabled RR-LWD toe protection would stabilize bank; tree stabilization would require encroachment; reach is wide enough to accommodate 3-4 ft of encroachment without impacting RB
FX CK LB	A-39	8,775	8,830	55	CLASS A	NO-ACTION	Relatively stable ch position
FX CK LB	B*-16	8,711	8,775	64	CLASS B*	ACTION	Existing approx. 1(H):1(V) 16-17 ft-high bank with bedrock exposed in the toe; numerous shallow failures in bank; bank is covered entirely with blackberries with some acacias at top of bank; Recommend project to restore canopy; Recommend laying back bank to maximum 1.25(H):1(V) slope, beginning from exposed bedrock toe, hydroseed, place geofabric, plant, and irrigate; Recommend also installing cabled RR-LWD toe protection at selected locations along toe of finished bank to reduce shear stress at toe and mid-bank; good construction access from public street at top of LB
FX CK LB	S-61	8,626	8,711	85	RR BANK	NO-ACTION	RR bank structure appears encroached into channel approx. 8-10 horiz ft
FX CK LB	B*-15	8,584	8,626	42	CLASS B*	ACTION	Recent and continuing erosion of mid-bank and upper-bank material from 16 ft-high 1(H):1(V) sloped bank; some existing RR appear to have been dumped into the channel onto the bed along the toe of bank ranging from light-class to 1/2-ton; Poor RR design contributed to bank erosion (outflanking); Recommend project to incorporate cable-anchored LWD and some new RR to stabilize toe and mid-bank and grade bank upper bank to stabilize overall site and restore canopy cover in canopy limited reach; Site is dominated by blackberry and acacia; Recommend careful design of cabled LWD-rootwad-RR structure to deflect shear stress away from LB without increasing erosion pressure at RB; existing bkf ch width is equal to or less than recommended design bkf width for reach; Grade mid- and upper-bank back to maximum 1.25(H):1(V), hydroseed, place geofabric, plant, and irrigate; good construction access from public street at top of LB
FX CK LB	A-38	8,548	8,584	36	CLASS A	NO-ACTION	Well-vegetated bank at relatively stable ch position

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	B*-14	8,436	8,548	112	CLASS B*	NO-ACTION	Recent and continuing erosion of fine material from 13-14 ft-high greater than 1(H):1(V) bank above exposed bedrock toe; TOB structures do not appear threatened; 3 mid-bank bays and 1 redwood threatened but not important to existing canopy cover; construction equipment access appears very limited; bank stabilization would achieve sediment source site reduction objective only; grouted light-class RR dam spans channel and contributes to toe and mid-bank erosion at site; removing the grouted rock dam and laying back bank to maximum 1.25(H):1(V) slope would reduce continuing erosion at expense of existing native trees; careful design and installation of cabled-LWD-RR structure at location of removed dam would reduce shear stress on finished bank; May be possible to install a smaller cabled-LWD-RR structure immediately d/s from dam to stabilize site without laying back bank and removing trees.
FX CK LB	A-37	8,150	8,436	286	CLASS A	NO-ACTION	Well-vegetated bank in relatively stable, straight ch position
FX CK LB	C-1	8,114	8,150	36	CLASS C	ACTION	Mature bay tree threatened at lower mid-bank level; loss of tree would have negligible impact on existing canopy cover; Recommend heavily pruning tree or removing tree to prevent potential debris blockage if tree failed during flood; may be possible to cut tree, leaving live stump and root matrix, and cabling tree piece(s) down along toe of bank to placed 1/2-ton rip-rap; reach is equal to or less than recommended design bkf ch width, so LWD placement would need to be carefully designed and installed; again, equipment access appears limited
FX CK LB	A-36	8,042	8,114	72	CLASS A	NO-ACTION	Well-vegetated bank in relatively stable, straight ch position
FX CK LB	S-60	8,035	8,042	7	VERT CONC HEADWALL	NO-ACTION	Existing storm drain outlet headwall
FX CK LB	B-23	8,024	8,035	11	CLASS B	NO-ACTION	Frequent minor erosion near toe of bank appears result of numerous bank stabilization structures in reach; appears self-stabilizing; approx. 1(H):1(V) sloped mid- and upper bank is well-vegetated but with no mature trees; canopy cover is not limited in reach;
FX CK LB	S-59	8,009	8,024	15	SACKRETE TOE WALL	NO-ACTION	Grouted sackrete toe wall; partially undermined; sackrete wall encroached into relatively narrow reach
FX CK LB	S-58	8000	8009	9	VERT CONC WINGWALL	NO-ACTION	Vertical concrete wingwall, in good condition

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FX CK LB	S-57	8,000	7,866	134	CULVERT	ACTION	Sir Francis Drake Blvd culvert; 8 ft-diam CMP; existing polymer-coated CMP in d/s 23 ft-long section; culvert capacity less than Dec 31, 2005 flood; Dec 31, 2005 flood overtopped channel u/s from culvert HWM approx 1.5 ft depth on chain-link fence along sidewalk above headwall; Recommend removal and replacement with 12-16 ft-wide, 10-ft high open bottom arch culvert on reinforced concrete strip footings;
FX CK LB	S-56	7,866	7,847	20	CULVERT	ACTION	Sir Francis Drake Blvd Culvert; polyvinyl-coated 8 ft-diam CMP section; see notes above
FX CK LB	B*-13	7,847	7,832	15	CLASS B*	ACTION	FFX SITE; Sir Francis Drake Blvd culvert outlet repair site; Dec 31, 2005 flood return flows from SFD Blvd and pressure flow in culvert caused backfill to erode from the d/s most section of the 8 ft-diam culvert, and the culvert section to detach and transport downstream; Recommend either replacing the culvert section and placing RSP on headwall and wingwalls to blend to existing LB and RB RR banks; <i>See detailed project site description and design recommendations in report</i>
FX CK LB	S-55	7,832	7,810	22	RR BANK	NO-ACTION	Stable, good condition
FX CK LB	B-22	7,810	7,767	44	CLASS B	NO-ACTION	Recent bank toe erosion; appears self-stabilizing response to bank stabilization structures in narrow reach and recent mid-channel bar deposit of coarse backfill material derived from the Dec 31, 2005 SFD culvert outlet failure; no structures or mature riparian vegetation threatened; native understory ground vegetation intact
FX CK LB	A-35	7,767	7,089	677	CLASS A	NO-ACTION	Well-vegetated bank in relatively stable, straight ch position
FX CK LB	B*-12	7,089	7,034	55	CLASS B*	ACTION	Recent, continuing bank erosion of fine bank material from steep bank along outside bend ch position; d/s end of site corresponds to d/s end of Village West property at failed concrete drainage ditch; no TOB structures or mature native riparian trees appear threatened; Recommend laying back bank from OHW to TOB at maximum 1.25(H):1(V) slope, hydroseed, place geofabric, plant, and irrigate; Recommend also installing cabled LWD-RR structures along toe of bank to reduce shear stress at lower and mid-bank; Establishing native riparian trees at top of bank would improve canopy cover in reach.
FX CK LB	A-34	7,034	6,706	328	CLASS A	NO-ACTION	Relatively stable ch position; note d/s end of apt bldg wall forms creek bank within site

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	B-21	6,706	6,598	107	CLASS B	ACTION	Recent minor bank erosion; Recommend project to stabilize oversteepened 1(H):1.5(V) bank and improve canopy cover in canopy-limited reach; Recommend laying back bank from exposed moderately dense clay at OHW up to TOB at maximum 1.5(H):1(V), hydroseeding, placing geofabric, planting, and irrigating; Project feasibility may be limited by need to save existing TOB and/or fence;
FX CK LB	S-54	6,598	6,555	44	VERT CONC RET WALL	NO-ACTION	Existing alder tree roots stabilize toe of bank
FX CK LB	B-20	6,555	6,495	59	CLASS B	ACTION	Recent minor bank erosion; Recommend project to improve canopy cover; Recommend laying back bank from OHW up to TOB fence at maximum 1.5(H):1(V), hydroseeding, placing geofabric, planting, and irrigating; Project feasibility may be limited by need to save existing TOB and/or fence;
FX CK LB	A-33	6,495	6,467	29	CLASS A	NO-ACTION	Well-vegetated bank in relatively stable ch position
FX CK LB	B-19	6,467	6,353	114	CLASS B	ACTION	For sediment and natural vegetation enhancement only; Recommend 3:1 up to fence with native understory and tree enhancement.
FX CK LB	S-53	6,353	6,332	21	CULVERT	ACTION	Pvt driveway crossing; 5' high by 7' wide rectangular concrete box culvert; undersized culvert opening appears to produce flooding onto LB apt complex property and RB Olema Rd; Recommend removal and replacement with larger culvert or restored natural channel if room allows and a clear-span bridge deck crossing; Project design by Questa, Inc. underway
FX CK LB	S-52	6,332	6,212	121	CULVERT	ACTION	Existing open rectangular concrete box culvert; 5.5 ft-high by 7 ft-wide; undersized culvert; Recommend removal and replacement with wider culvert or restored natural channel if room allows; width constrained reach; May be possible to replace channel with natural channel banks that would support riparian vegetation to reestablish canopy cover in reach; Project design by Questa Inc. underway
FX CK LB	S-51	6,212	6,210	2	CONC APRON	ACTION	Concrete apron at outlet of open rectangular concrete box culvert; Recommend removal as part of u/s culvert replacement project
FX CK LB	A-32	6,210	6,187	23	CLASS A	NO-ACTION	Relatively stable ch position; well-vegetated; Bank toe stabilization or grade control would likely be required if Westbrae-Olema dam were partially removed for flood management purposes (may be component of Questa, Inc. design for u/s culvert replacement)

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/ Structure Class	Recommend Action/ No-Action	Site/Structure Description
FX CK LB	B-18	6,187	5,940	247	CLASS B	NO-ACTION	Frequent minor erosion prevents vegetation establishment along 7-8 ft-high bank in slight outside bend ch position; Appears self-stabilizing and there are no structures threatened near top of bank; All bank vegetation is non-native except for a few alder and bay; Bank stabilization would achieve sediment source reduction and aesthetics improvement objectives; Existing canopy cover is fair to good in this reach; Bank toe stabilization or grade control would likely be required if Westbrae-Olema dam were partially removed for flood management purposes (may be component of Questa, Inc. design for u/s culvert replacement); May be possible to lay back the bank from OHW to TOB at maximum 1.5(H):1(V) slope and establish native riparian trees to replace non-natives
FX CK LB	S-50	5,940	5,932	8	DAM	NO-ACTION	Westbrae-Olema dam; reinforced concrete dam structure; complete fish barrier; Recommend removal and replacement with a roughened ramp fish passage structure if and when the d/s Bolinas-Sherman Avenue culvert is replaced; Dam removal would require substantial bank stabilization and grade control work u/s; It would be more feasible to replace the dam with a roughened ramp structure that includes substantial fill in the channel d/s from the dam
FX CK LB	B*-11	5,932	5,925	7	CLASS B*	ACTION	Upper bank failure at top of 18 ft-high bank immediately d/s from dam appears to be caused by stormwater runoff from apt bldg parking lot at TOB; Canopy not limited in this reach; Recommend either installing a catch-basin to collect runoff and direct it downslope in anchored CMP down drain discharging onto new rip-rap apron or existing concrete dam apron, or lining the bank with filter fabric and light-class rip-rap to serve as stable spillway
FX CK LB	A-31	5,926	5,911	15	CLASS A	NO-ACTION	Relatively stable inside bend ch position; 18 ft-high bank composed of native clayey soil and random fill with mature vegetation
FX CK LB	B-17	5,911	5,861	50	CLASS B	NO-ACTION	Recent minor bank erosion at lower and mid-bank on 18 ft-high approx. 1(H):2(V) sloped bank dominated by mature vegetation side bend with mature trees; Bank stabilization would achieve sediment source site reduction objective only;
FX CK LB	A-30	5,861	5,817	44	CLASS A	NO-ACTION	Relatively stable inside bend ch position; 18 ft-high bank composed of native clayey soil and random fill with mature vegetation
FX CK LB	S-49	5,817	5,775	42	RR BANK	NO-ACTION	RR bank to WSE + 18 ft; Bank appears composed of random fill from apt bldg parking lot construction that required stabilization due to steepness and lack of soil strength compared to natural banks; RR bank is stable with good vegetation cover
FX CK LB	A-29	5,775	5,721	54	CLASS A	NO-ACTION	Relatively stable inside bend ch position; 18 ft-high bank composed of native clayey soil and random fill with mature vegetation

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	B*-10	5,722	5,699	23	CLASS B*	ACTION	Recent and continuing bank failure site at outside bend ch position at corner of apt bldg parking lot and Sir Francis Drake Blvd; Channel bend was apparently made artificially close to 90 degrees by construction of apt bldg parking lot or earlier site development; numerous mature native riparian trees at TOB threatened by continuing erosion; Future mass failures in the 18-20 ft-high approx. 1(H):1.75(V) bank threaten sidewalk and light standard adjacent to SFD Blvd; Recommend monitoring site and/or installing 1/2- to 1-ton RR bank to WSE + 8 ft; Access for construction equipment is very limited; Possible to construct RR bank with "long-reach" excavator from TOB apt bldg parking lot if portion of mature TOB riparian vegetation removed; Recommended to allow toe of RR bank structure to encroach into the current channel to pre-failure bank toe line; Also recommended to incorporate anchor-cabled LWD into toe of bank designed to create scour pool at manageable location within outside bend ch position; existing alder tree root stabilized bank forms d/s end of site
FX CK LB	A-26	5,699	5,667	32	CLASS A	NO-ACTION	18-20 ft-high approx. 1(H):2(V) sloped bank; SFD Blvd sidewalk and telephone pole at TOB;
FX CK LB	S-48	5,667	5,621	46	RR BANK	NO-ACTION	RR bank to WSE + 9 ft
FX CK LB	S-47	5,621	5,585	36	CLASS A	NO-ACTION	Alder roots stabilize toe of bank; existing nr-vert RR wall at mid-bank
FX CK LB	B*9	5,585	5,562	23	CLASS B*	ACTION	Recent bank failure with 18 in-diam RCP storm drain outlet at WSE + 12 ft within failure; existing alder tree roots stabilize toe of bank; Recommend placing 1/4-ton RR from WSE + 4 ft to WSE + 10 ft within bank failure area to stabilize bank and support storm drain outlet
FX CK LB	A-27	5,562	5,357	206	CLASS A	NO-ACTION	Well-vegetated bank in relatively stable, straight ch position
FX CK LB	A-26	5,357	5,346	11	CONCRETE APRON	NO-ACTION	Existing concrete apron along toe of bank
FX CK LB	B-16	5,346	5,308	38	CLASS B	NO-ACTION	Frequent minor bank erosion at toe and mid-bank along approx. 1(H):1(V) sloped bank; Med dense clay exposed in toe of bank with numerous mature trees and fence at TOB; Site stabilization would achieve sediment source reduction objective only
FX CK LB	A-25	5,308	4,963	345	CLASS A	NO-ACTION	Well-vegetated bank in relatively stable, straight ch position
FX CK LB	S-46	4,963	4,933	30	RR BANK	NO-ACTION	RR bank up to WSE + 4 ft; SFD Blvd traffic light standard nr TOB
FX CK LB	A-24	4,933	4,888	45	CLASS A	NO-ACTION	Well-vegetated bank in relatively stable, straight ch position
FX CK LB	S-45	4,888	4,867	21	RR BANK	NO-ACTION	Note: some native trees at top of bank but canopy cover is limited in this reach
FX CK LB	A-23	4,868	4,780	88	CLASS A	NO-ACTION	Existing alder tree roots stabilize toe of bank

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FX CK LB	B-15	4,780	4,735	45	CLASS B	NO-ACTION	Frequent minor bank toe erosion; Erosion in upstream section of site caused by u/s RB RR bank encroachment; Appears self-stabilizing; Bank stabilization project would achieve sediment source reduction objective only and at expense of existing native vegetation on bank; construction access from LB TOB appears limited by steepness of upper bank and mature riparian trees at TOB and narrow ROW along SFD Blvd only;
FX CK LB	B*8	4,735	4,682	53	CLASS B*	ACTION	Recent rotational slope failure; May have been initiated or exacerbated by toe erosion caused by encroached RR bank u/s on RB; Recommend installing a vegetated RR toe wall with its base along estimated pre-failure bank toe line, extending from WSE - 3 ft up to WSE + 5 ft, and sloped at max 1(H):1(V)
FX CK LB	A-22	4,682	4,662	20	CLASS A	NO-ACTION	Relatively stable, straight ch position; well-vegetated
FX CK LB	B*-7	4,662	4,574	88	CLASS B*	NO-ACTION	Recent and continuing bank toe erosion; appears caused by recent RB failure u/s; medium density clay exposed in toe of bank; no structures threatened and poor construction access without removing numerous native trees; gradual sloped bank up to SFD Blvd at TOB; Bank stabilization at site would achieve sediment source site reduction objective only
FX CK LB	S-44	4,574	4,537	37	RR BANK	NO-ACTION	RR bank in good condition
FX CK LB	S-43	4,537	4,518	19	RR BANK	ACTION	Recent bank failure at TOB along SFD Blvd guard rail; SFG Blvd ROW threatened; Recommend placing light-class RR fill in failure footed on top of existing RR bank below failure; steepness and shade make bioengineered treatment less feasible; may be possible to fill failure with mechanically stabilized earth (soil lifts) with geofabric reinforcement; Canopy cover is adequate in this reach
FX CK LB	S-42	4,518	4,499	19	RR BANK	NO-ACTION	RR bank in good condition
FX CK LB	S-41	4,499	4,479	20	VERT CONC RET WALL	NO-ACTION	Approx. 16 ft-high vertical concrete wall beneath SFD Blvd ROW; wall footing is undermined 1-1.5 vertical ft; Recommend monitoring wall batter angle and toe elevation to evaluate wall stability
FX CK LB	S-40	4,479	4,336	143	RR TOE WALL	NO-ACTION	Combination RR toe wall with vertical steel modular crib retaining wall above varies from 20 total vertical feet high to 12 total vertical feet high from u/s to d/s end; the u/s two-thirds of the length of the structure is undermined approx. 1 vertical foot; alder roots stabilize alluvial material beneath the RR toe wall in the d/s one-third of the structure's length; Structure is beneath SFD Blvd ROW; Recommend monitoring batter angle and toe elevation of wall to evaluate wall stability
FX CK LB	A-21	4,336	4,219	117	CLASS A	NO-ACTION	Relatively stable, straight ch position; well-vegetated; negligible erosion at toe of bank

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	B*-6	4,220	4,192	28	CLASS B*	ACTION	Recent bank failure at unstable outside bend ch position; bank immediately upstream from recent failure is prone to collapse; Moderately dense clay exposed in toe of bank; failure is in clayey-sandy-silt material forming mid- and upper bank; overall bank slope up to TOB along SFD Blvd ROW is relatively gradual; no mature riparian vegetation or infrastructure appears threatened by recent or immediate future bank failures; stabilizing site would achieve sediment source site reduction objective and increase overall upper bank stability for establishing permanent mature riparian vegetation in a somewhat canopy cover limited reach; Recommend stabilizing site by laying back the bank from OHW up to mid-bank and excavating and removing upper horizon of the clayey-silt deposit forming the bank through the d/s end of the outside channel bend to allow flood flows to cut-off the bend; Recommend lowering the elevation on the left bank immediately downstream to not more than approx. WSE + 5 ft to allow approx. 5-year floods to overtop and cut-off the bend; Grading down the left bank in the bend would result in loss of 4-5 box elders; Recommend saving alder tree rooted in the toe of the bank near the d/s terminus of the bend, as a root-reinforced island in the flow path; Construction equipment access may be limited to access from SFD Blvd; Consider extending project d/s to inlet of Marin Road Bridge culvert if it would help meet flood management objective
FX CK LB	A-20	4,192	4,121	71	CLASS A	NO-ACTION	Stable inside bend ch position immediately downstream from an outside bend channel position; Recommend extending upstream grading and floodplain channel restoration project through this reach down to the inlet of Marin Road Bridge culvert if it is a flood management objective to improve flood conveyance through the Marin Road culvert
FX CK LB	S-39	4,121	4,093	28	VERT CONC U/S WINGWALL	NO-ACTION	Good condition; because left 30% of the opening width of Marin Road Bridge culvert appears ineffective, wingwall modification may be beneficial to flow conveyance, as could be combined u/s LB bank grading and floodplain restoration projects
FX CK LB	S-38	4,093	4,065	28	CULVERT	NO-ACTION	Marin Rd Bridge culvert; 26 ft-wide 8 ft-high elliptical arch culvert on concrete strip footings with natural bottom; LB gr bar up to WSE + 1 ft; approx. 6-8 ft-wide ineffective flow area at LB edge of culvert at inlet; approx. 3 ft-wide ineffective flow area at LB edge at outlet; existing alder 10 ft d/s from outlet does not appear to constrain flow conveyance capacity of culvert; high water marks not adequate to determine if culvert caused overbank flow during the December 31, 2005 flood
FX CK LB	S-37	4065	4,055	10	VERT CONC D/S WINGWALL	NO-ACTION	Wingwall failed; post-flood evidence is inadequate to determine if wingwall redesign and repair may be beneficial to flood conveyance by reducing exit losses
FX CK LB	S-36	4,055	3,998	57	RR BANK	NO-ACTION	Structure appears stable
FX CK LB	A-19	3,998	3,900	98	CLASS A	NO-ACTION	Stable inside bend ch position

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	B-14	3,900	3,886	14	CLASS B	NO-ACTION	Recent bank erosion on approx. 1(H):1(V) sloped bank immediately downstream from large oak tree rooted at approx. WSE + 10 ft; Bank erosion area appear self-stabilized; relatively wide reach
FX CK LB	A-18	3,886	3,847	38	CLASS A	NO-ACTION	Relatively stable ch position
FX CK LB	S-35	3,847	3,699	148	VERTICAL RR WALL	NO-ACTION	Near vertical grouted rock rip-rap wall extending up to WSE + 17 ft; Wall is in poor condition with cracks and undermining; structure appears to have encroached min 4-6 horiz ft
FX CK LB	S-34	3,699	3,643	56	VERT CONC RET WALL	NO-ACTION	17 ft-high near-vertical grouted RR wall section ends at 60 degree bend giving way to 10 ft-high vertical concrete retaining wall; Recommend cable-anchoring root wad at base of wall joint to replace or enhance the existing 2 ft-diam grouted rock laying in the channel having dislodged from RR wall foundation
FX CK LB	S-33	3,643	3,559	83	VERT CONC RET WALL	NO-ACTION	Good condition, extends up to WSE + 6 ft
FX CK LB	S-32	3,559	3,543	16	SACKRETE WALL	NO-ACTION	Sackrete wall extends up to WSE + 6 ft
FX CK LB	A-17	3,543	3,517	26	CLASS A	NO-ACTION	Relatively stable ch position
FX CK LB	B-13	3,517	3,482	35	CLASS B	NO-ACTION	Recent minor bank erosion; existing alder roots stabilize toe of bank; recent bank erosion appears self-stabilizing; residential patio structure at TOB
FX CK LB	A-16	3,482	3,417	64	CLASS A	NO-ACTION	Relatively stable ch position
FX CK LB	B-12	3,417	3,373	44	CLASS B	NO-ACTION	Recent erosion along lower portion of approx. 1(H):1(V) bank dominated by all non-native mid and upper bank vegetation; oak tree at TOB at d/s end of site; Stabilization would appear to achieve sediment source site reduction objective only; May be possible to lay back the bank from OHW to TOB at maximum 1.5(H):1(V) slope, hydroseed, place geofabric, plant, and irrigate; final bank grade would need to blend to approx. 1(H):1(V) existing slope at d/s end to protect TOB oak
FX CK LB	A-15	3,373	3,364	9	CLASS A	NO-ACTION	Relatively stable ch position
FX CK LB	S-31	3,364	3,356	7	VERT CONC U/S WINGWALL	NO-ACTION	Wingwall replacement may increase flow conveyance through culvert by reducing entrance losses; requires analysis

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	S-30	3,356	3,324	32	CULVERT	NO-ACTION	Olema Road Bridge culvert; 13.7 ft-wide by 9.7 ft-high concrete rectangular box culvert approx. at grade; 10 in-diam cast iron sewer pipe reduces effective ht of opening to approx. WSE + 8 ft near d/s end of culvert; RB weeping willow d/s from outlet recommended for removal due to evidence of debris blockage; Modifying or replacing u/s wingwalls may reduce culvert entrance losses; Analysis required to identify and prioritize flood management objectives and design solutions
FX CK LB	S-29	3,324	3,311	14	VERT CONC D/S WINGWALL	NO-ACTION	Wingwall replacement may increase flow conveyance through culvert by reducing exit losses; requires analysis
FX CK LB	A-14	3,311	3,278	33	CLASS A	NO-ACTION	Relatively stable ch position immediately d/s from Olema Road box culvert wingwall
FX CK LB	S-28	3,278	3,266	12	BDGE	NO-ACTION	Private driveway bridge; 19 ft-wide, 11 ft-high area between piers effective; bank areas ineffective; does not appear to be a constriction
FX CK LB	A-13	3265.75	3,248	18	CLASS A	NO-ACTION	Relatively stable ch position
FX CK LB	S-27	3,248	3,242	6	VERT CONC RET WALL	NO-ACTION	Good condition; vertical wall is abutment for d/s pedestrian bridge
FX CK LB	S-26	3,242	3,238	5	BDGE	NO-ACTION	Private pedestrian footbridge with vert conc ret wall abutments; does not appear to be a flood constriction
FX CK LB	B-11	3,238	3,200	38	CLASS B	NO-ACTION	Mature alder rooted near center of channel flow path d/s from private pedestrian bridge appears to force portion of flow directly into left bank causing recent erosion of clayey-silty-sand material exposed in toe and mid-bank exposing roots of TOB cottonwood trees; site appears somewhat self-stabilized; no structures appear near TOB; May be possible to stabilize site by placing cable-anchored LWD and RR pieces in the void space to save mature TOB cottonwoods; Allowing minor bank erosion to continue in this reach would serve to widen the channel and self-stabilize the banks over time
FX CK LB	A-12	3,200	3,102	99	CLASS A	NO-ACTION	Relatively stable ch position
FX CK LB	S-25	3,102	3,080	22	RR BANK	NO-ACTION	Good condition
FX CK LB	B-10	3,080	3,047	33	CLASS B	NO-ACTION	Recent erosion at lower and mid-bank on 15 ft-high bank; Likely to continue erosion and prone to slump failure; Site stabilization would achieve sediment source site reduction objective but no mature riparian trees or TOB structures appear threatened; canopy cover is adequate surrounding the site
FX CK LB	A-11	3,047	2,938	110	CLASS A	NO-ACTION	Relatively stable ch position

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	B-9	2,938	2,769	169	CLASS B	NO-ACTION	Recent low-bank erosion along a 16 ft-high approx. 1(H):1(V) sloped bank appears to be caused by encroachment into channel by u/s RB grouted wall; existing alder roots stabilize toe of bank; numerous native riparian trees on bank; appears to be a wide riparian tree buffer in this reach, possibly associated with Fairfax library property upslope; stabilizing the bank would achieve sediment source site reduction objective only
FX CK LB	A-10	2,769	2,730	39	CLASS A	NO-ACTION	Relatively stable ch position
FX CK LB	B-8	2,730	2,712	19	CLASS B	NO-ACTION	Recent slope failure in 15 ft-high bank at unstable outside bend ch position likely caused by recent large u/s RB slope failure including and Lombardy poplar tree deposited in ch from RB failure; no structures or mature native riparian trees appear threatened by recent and likely ongoing LB bank erosion; Canopy cover is very limited in this reach; Stabilizing the bank would achieve sediment source site reduction objective and possibly create more stable bank material for establishing self-sustaining native riparian vegetation and tree canopy; Site stabilization recommended if u/s RB reach-scale recommend site treatment is undertaken to reduce erosion, improve flood conveyance, and replace Lombardy poplar tree canopy
FX CK LB	S-24	2,712	2,673	39	RUBBLE WALL	NO-ACTION	Failed, self-stabilized broken concrete rubble wall
FX CK LB	B-7	2,673	2,604	69	VERT TIMBER RET WALL	ACTION	Failing vertical timber retaining wall in poor condition with mature Lombardy poplar trees at top of bank and willow established along toe of bank; If increasing flow conveyance through d/s Scenic Road Bridge culvert is identified by more detailed analysis to be a priority flood management objective, it will likely be necessary to severely modify this retaining wall; the wall appears encroached into the channel and its planform alignment causes a 3 ft-wide ineffective flow area along the left edge of the culvert; To maximize flood flow conveyance through the existing Scenic Road Bridge culvert, recommend removing the wall and Lombardy poplar trees and laying back the bank as far as feasible
FX CK LB	S-23	2,604	2,595	10	VERT RUBBLE RET WALL	ACTION	Vertical stacked broken concrete rubble u/s wingwall appears encroached into channel and contributes to estimated 3 ft-wide ineffective flow area at LB edge of d/s Scenic Road Bridge culvert; Recommend at a minimum removal of existing trees rooted at the toe of the rubble wall and within the wall to increase open flow path conditions immediately upstream from the culvert inlet, while leaving the tree roots in place to continue stabilizing the wall; To maximize flood flow conveyance of the existing Scenic Road Bridge culvert, recommend removal of the wall and the u/s vertical timber retaining wall and laying back the bank as far as feasible over 80 ft-long reach u/s from culvert inlet

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	S-22	2,595	2,555	40	CULVERT	ACTION	Scenic Road Bridge culvert; 14 ft-wide by 11 ft-high concrete box culvert; left 3 ft ineffective; top 3 ft partially ineffective; u/s RB wingwall only 20 degrees from face; Lombardy Poplars at LB TOB block entrance to culvert and should be removed either alone or as part of bank regrading project to decrease culvert entrance losses; d/s RB and LB wingwalls either failing or poorly designed; Recommend replacing both with new vertical wingwalls angled $\tan^{-1}(3)$ deg from face
FX CK LB	S-21	2,555	2,513	42	VERT CONC RET WALL	ACTION	Existing vertical concrete wingwall is continuous with left inside edge of u/s vertical concrete box culvert walls; If it is a flood management objective to increase the flood conveyance of the existing culvert without completely replacing the culvert, then it would probably be beneficial to replace the existing LB d/s wingwall with a wingwall battered back from vertical and angled away from the flow path direction at an angle equal to $\tan^{-1}(3)$ extending d/s an additional 17 ft from end of existing wall to daylight into the finished bank near the existing mature tree at top of bank
FX CK LB	A-9	2,513	2,480	33	CLASS A	NO-ACTION	Relatively stable slightly inside bend ch position d/s from culvert outlet
FX CK LB	B-6	2,480	2,415	65	CLASS B	NO-ACTION	Recent minor bank erosion at lower horizon of 14 ft-high 1(H):2(V) sloped bank apparently result of ongoing ch adjustment to RB vert conc ret wall; existing alder roots stabilize toe of bank; existing ch bkf width is less than or equal to recommended minimum design bkf width; Erosion appears self-stabilizing; Site stabilization would require vertical wall construction and partial removal of existing canopy cover
FX CK LB	A-8	2,415	2,404	12	CLASS A	NO-ACTION	Relatively stable ch position
FX CK LB	S-20	2,404	2,340	64	VERT CONC RET WALL	NO-ACTION	Good condition; both LB and RB vert conc ret walls appear encroached
FX CK LB	S-19	2,340	2,331	10	BDGE	NO-ACTION	Private driveway clear-span bridge deck crossing; Spans between vert conc ret walls at both banks with natural bottom; 17 ft-wide by 8.5 ft-high; Bridge deck appears to somewhat reduce flood conveyance capacity of the vert conc ret wall confined reach u/s but does not appear to be a severe flood constriction; no high water mark evidence near site to determine effect of bridge deck on flood WSE profile during Dec 31, 2005 flood
FX CK LB	S-18	2330.6	2,313	18	VERT CONC RET WALL	NO-ACTION	Good condition

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	A-7	2,313	2,299	14	CLASS A	NO-ACTION	Existing willow tree rooted low on the LB within flow path of u/s vert conc ret wall confined reach and u/s private bridge; To maximize flood conveyance of existing u/s channel, recommend periodic heavy pruning of willow tree allowing roots to survive and continue to reinforce natural bank
FX CK LB	S-17	2,299	2,270	30	RR TOE	NO-ACTION	Stable condition
FX CK LB	S-16	2,270	2,227	43	RR BANK	NO-ACTION	Stable condition
FX CK LB	S-15	2,227	2,221	7	VERT CONC RET WALL	NO-ACTION	Stable condition
FX CK LB	S-14	2,221	2,175	46	CULVERT	NO-ACTION	Azalea Road Bridge culvert; 15.2 ft-wide by 8.5 ft-high natural bottom rect conc culvert; 2.5 ft-wide section at edge of RB wall appears ineffective; 40 degree bend at entrance to culvert; To maximize flood flow conveyance capacity of the existing culvert, reduce entrance losses and ineffective width within the culvert by laying back RB over 120 ft-long reach upstream from the inlet and replace with vert conc ret wall with wing wall section aligned to form 3:1 width transition to culvert inlet as may be constrained to match existing at TOB Arroyo Avenue roadbed; More detailed hydraulic analysis is required to determine if these actions would be sufficient to achieve tbd flood management objective for the crossing; Complete culvert removal and replacement may be required to provide sufficient flood flow conveyance through crossing
FX CK LB	S-13	2,175	2,109	66	VERT RUBBLE D/S WINGWALL	NO-ACTION	Grouted rock wall up to WSE + 5-7 ft; stable condition
FX CK LB	S-12	2,109	2,047	62	VERT CONC RET WALL	NO-ACTION	Vert conc ret wall up to WSE + 4 ft; vert timber ret wall above; stable condition
FX CK LB	S-11	2047	2,014	33	VERT TIMBER RET WALL	NO-ACTION	Vert timber ret wall up to WSE + 8 ft; stable condition
FX CK LB	S-10	1,953	1,880	73	VERT CONC RET WALL	NO-ACTION	Stable condition

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	S-9	1,880	1,840	40	CULVERT	NO-ACTION	Spruce St Bridge culvert; 17.6 ft-wide by 10.3 ft-high natural bottom rectangular concrete box culvert; 3.5 ft-wide ineffective along LB edge of culvert caused by culvert's 40 degree turn to left and trees situated within flow path immediately upstream from inlet; BR outcrop in bed of channel along LB and in toe of LB bar within inlet the through length of culvert; To maximize flood flow conveyance of the existing Spruce St culvert, recommend remove u/s-most of two u/s alder trees to reduce entrance losses; d/s exit conditions do not appear limiting, although RB d/s from culvert outlet is slightly within flow path; Bank stabilization projects are recommended at both LB and RB downstream from culvert which should be designed to lay back not encroach into the channel to maximize flow conveyance through culvert
FX CK LB	B-5	1,840	1,787	53	CLASS B	ACTION	Frequent mid-bank and upper bank erosion and numerous minor bank slumps along 15 ft-high approx. 1(H):2(V) sloped bank beginning d/s from the Spruce St culvert outlet and extending downstream to end of straight reach and beginning of gravel bar at ch bend; BR exposed in bed and bank up to WSE + 4 ft; Recommend project to stabilize banks, save selected mature TOB native riparian trees, and not encroach into channel as may reduce Spruce St culvert's flood flow conveyance capacity; Very difficult site; Project design for all banks between Merwin Ave and Spruce St need to be designed in a coordinated reach-scale fashion given the effect any isolated projects would have on other vulnerable sites within reach
FX CK LB	B*-5	1,787	1,707	80	CLASS B*	ACTION	Recent mid-bank erosion along 9 ft-high approximately 1(H):2(V) to 1(H):3(V) sloped bank downstream from threatened TOB native walnut tree; Medium density clayey-silt exposed in bank up to WSE + 3 ft; BR also exposed in toe of channel up to WSE + 1 ft only in upstream portion of site; Recommend project to stabilize banks, save selected mature TOB native riparian trees, and restore a ch bkf width equal to or exceeding 17 ft; Very difficult site; Project design for all banks between Merwin Ave and Spruce St need to be designed in a coordinated reach-scale fashion given the effect any isolated projects would have on other vulnerable sites within reach

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	B-4	1,707	1,637	70	CLASS B	NO-ACTION	Recent bank scour resulting in steep exposed clayey-silt banks and lack of vegetation cover; No TOB structures or mature riparian trees appear threatened; Stabilizing site would achieve sediment source reduction objective only; Site stabilization recommended only as part of reach-scale coordinated design and construction project addressing both banks between Merwin Ave and Spruce St; Presence of moderately dense clayey toe material and coarse gr bar may allow for a design requiring keyed-in vegetated rip-rap toe wall only in the upstream portion of the site u/s from the gr bar, and treating the banks above the OHW by grading back bank from OHW to TOB at 1.25(H):1(V) maximum slope, hydroseeding, placing fabric, planting, and irrigating
FX CK LB	S-8	1,637	1,578	59	VERT TIMBER RET WALL	ACTION	Existing vert timber ret wall in poor and partially failed condition; Very narrow and sinuous ch at site; Recommend replacement only according to reach-scale design including removal and replacement of d/s Merwin Ave culvert
FX CK LB	S-7	1578	1,543	35	BDGE	ACTION	Merwin Ave Bridge culvert; 18 ft-wide by 6.5 ft-high natural bottom rectangular concrete box culvert; extremely high entrance and exit losses caused by sinuous ch planform u/s and d/s; Recommend removal and replacement of structure with new planform and replacement and/or modification of existing bank stabilization structures to provide for minimum 18-ft-width throughout reach-scale site; Replacement has ramifications for sites u/s to Spruce St; Recommend all LB and RB sites between Town of Fairfax Peri Park and Spruce St be combined into one comprehensive reach-scale channel and riparian canopy enhancement and flood management improvement project
FX CK LB	B-3	1,543	1,469	74	CLASS B	ACTION	Relatively steep 8-9 ft-high bank at inside bend ch position in very narrow reach immediately d/s from Merwin Ave culvert; numerous mature redwood trees at TOB and some unimproved parking spaces would be lost by stabilization project; Merwin Ave culvert is recommended for removal and replacement to improve flood flow conveyance through reach; The reach d/s from Merwin Ave is very narrow, partially due to encroachment by RB gabion and vert conc ret wall structures; increasing flood conveyance through the reach will likely require both removal and replacement of existing Merwin Ave culvert and widening of the reach immediately downstream; It may be required to remove the RB gabion and vert conc ret wall structures or grading back the LB at this site with loss of numerous TOB redwood trees
FX CK LB	S-6	1,469	1,441	28	RR BANK	NO-ACTION	RR bank in good condition; encroached into channel 3-6 ft; extends up to WSE + 10 ft; toe of RR bank is grouted

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	B*-4	1,441	1,391	49	CLASS B*	ACTION	Recent severe bank slope failure at d/s end of u/s RR bank apparently caused by RB vert conc ret wall u/s and immediately u/s LB RR bank; Existing parking area at TOB with numerous long-term parked cars; Recommend stabilization site to prevent additional bank failures d/s; Recommended site design depends on design selected for the Peri Park Tennis Courts site (FFX site), and the overall creek restoration and flood management plan for Peri Park; To provide immediate stabilization for existing parking area, recommend continuing u/s LB RR bank through failure site matching existing grade at d/s group of trees including mature acacia and alder near toe of bank, and bay, and ash trees and mid- and upper bank; D/S LB property appears to be owned by Town of Fairfax and may be part of Peri Park; D/S property is flat with numerous mature riparian trees only along TOB; Alternative design for site is for floodplain restoration at d/s LB park property and would require laying back the bank within the existing failure and loss of exactly one existing parking lot space and either RR bank, vertical wall, or near-vertical redwood log crib wall, depending on more detailed site planning and design as part of a comprehensive reach-scale restoration and management plan needed for Peri Park.
FX CK LB	A-6	1,391	1,312	79	CLASS A	NO-ACTION	Relatively stable inside bend ch position; numerous acacia trees at u/s end of site tbr if site is graded and revegetated If proposed LB floodplain restoration project is included in comprehensive site plan for Peri Park; selected native trees comprising majority of existing riparian canopy to be saved as part of proposed LB floodplain restoration project by creating an island of mature trees between existing ch and proposed fp and flood scour ch restoration area
FX CK LB	B-2	1,312	1,284	28	CLASS B	NO-ACTION	Recent minor bank erosion; Numerous native riparian trees at toe and TOB in upstream portion of site; Recently failed Peri Park footbridge vert conc abutment exposed near d/s portion of site; Bank could be stabilized by laying back the bank from OWH to 1.5(H):1(V) but project would need to be designed in coordination with the Peri Park Footbridge replacement project and the proposed LB floodplain restoration project.
FX CK LB	A-5	1,284	1,203	81	CLASS A	NO-ACTION	Stable inside bend ch position; bank may need to be regraded and revegetated if LB floodplain restoration project u/s is included in comprehensive site plan for Peri Park

Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	B*-3	1,203	1,142	61	CLASS B*	NO-ACTION	Recent severe bank toe erosion and mid-bank and upper bank slope failures within 30-35 ft-high approx. min 1(H):2(V) sloped bank at severely eroded outside bend ch position; existing mid- and upper bank redwood grove severely undermined and threatened; Very difficult site; Preventing loss of redwood grove would require installation of 80-120 ft-long 12-16 ft-high RR bank at 1(H):2(V) slope; RR bank would be difficult to vegetate given outside bend ch position and limited sunlight; likely be inconsistent with preserving natural channel banks and overall park-like aesthetic; Recommend designing solution for site consistent with overall comprehensive site plan for Peri Park, including proposed u/s LB floodplain restoration project and RB floodplain restoration project across the channel that would both serve to reduce shear stress on the severely eroded outside bend channel position and allow for room needed to bury a RR bank behind MSE soil lifts
FX CK LB	B*-2	1142	1,098	44	CLASS B*	NO-ACTION	Frequent lower and mid-bank erosion along d/s end of outside bend ch position exposing medium density clayey-silty-sand up to WSE + 6-8 ft; Recommend laying back the bank throughout site to allow flood flows to pass through the site and "cut-off" the sharp ch meander d/s from the site, only as part of comprehensive site-scale creek restoration and flood management plan needed for Peri Park
FX CK LB	A-4	1,098	1,018	80	CLASS A	NO-ACTION	Stable inside bend ch position; bank may need to be regraded and revegetated if included in comprehensive site plan for Peri Park
FX CK LB	B*-1	1,018	896	122	CLASS B*	NO-ACTION	Recent and ongoing severe bank erosion up to WSE + 15 ft on near-vertical lower 15-ft-high portion of 30-35 ft-high bank at vulnerable outside bend ch position; Very difficult site; Stabilization would require vertical wall or encroachment into channel with steep RR bank; d/s end of site at vertical conc abutment for utility xing; RR bank would be difficult to vegetate given outside bend ch position and limited sunlight; likely be inconsistent with preserving natural channel banks and overall park-like aesthetic; Recommend designing solution for site consistent with overall comprehensive site plan for Peri Park, including proposed RB and LB floodplain restoration projects to reduce shear stress on the severely eroded outside bend channel position and allow for room needed to bury a RR bank behind MSE soil lifts
FX CK LB	A-3	896	859	37	CLASS A	NO-ACTION	Relatively stable inside bend ch position; Site may require stabilization and revegetation as part of comprehensive reach-scale site plan for Peri Park; Specific site recommendation also depends on whether or not Bolinas-Fairfax Rd culvert is removed and replaced
FX CK LB	S-5	859	822	37	RR BANK	NO-ACTION	RR bank in fair condition; Very narrow channel in this reach; It may be required to remove the RR bank structure and restore the channel and increase flood flow conveyance capacity, depending primarily whether or not Bolinas-Fairfax Rd culvert is removed and replaced

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Creek Bank	Site ID	Begin Station (ft)	End Station (ft)	Site Length (ft)	Site/Structure Class	Recommend Action/No-Action	Site/Structure Description
FX CK LB	B-1	822	745	77	CLASS B	NO-ACTION	Recent minor bank erosion immediately d/s from u/s LB RR bank; D/s end of site at existing alder at toe of bank forming alder root stabilized bank toe d/s from site; Site may require stabilization and revegetation as part of design for recommended Bolinas-Fairfax Rd culvert removal and replacement
FX CK LB	A-2	745	658	87	CLASS A	NO-ACTION	Existing alder trees stabilize toe of bank; debris rack forms d/s end of site; Site may require stabilization and revegetation as part of design for recommended Bolinas-Fairfax Rd culvert removal and replacement
FX CK LB	S-4	658	652	6	VERT CONC U/S WINGWALL	NO-ACTION	Structure may require removal and replacement as part of design for recommended Bolinas-Fairfax Rd culvert removal and replacement
FX CK LB	S-3	652	625	27	CULVERT	NO-ACTION	Approx. 15 ft-wide by 7 ft-high open rectangular concrete box culvert with vert timber ret wall at TOB; Structure may require stabilization and revegetation as part of design for recommended Bolinas-Fairfax Rd culvert removal and replacement
FX CK LB	S-2	652	500	152	VERT TIMBER RET WALL	NO-ACTION	Structure may require removal and replacement as part of design for recommended Bolinas-Fairfax Rd culvert removal and replacement
FX CK LB	S-1	500	20	480	CULVERT	ACTION	Bolinas-Fairfax Rd culvert; rectangular concrete box culvert; inlet dimensions assumed same as outlet dimensions (10 ft-wide by 6 ft-high); Culvert is severe flood constriction; Recommend removal of culvert and replacement with larger culvert, natural channel restoration, or hybrid natural channel restoration and vertical sheetpile walls; Existing culvert is overlain by public and private housing, utilities, and infrastructure; Removal and replacement is an expensive complicated project; Apparently no feasibility study has been completed to date
FX CK LB	A-1	20	0	20	CLASS A	NO-ACTION	Bolinas-Fairfax Rd culvert; rectangular concrete box culvert; outlet dimensions measured 10 ft-wide by 6 ft-high; outlet invert perched approx. 3 ft above plunge pool WSE below; Approx. 20 ft-long stable reach d/s from culvert to confluence with San Anselmo Ck; 20 ft-long reach is stable and is within active channel of San Anselmo Ck