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Understanding the water, understanding the canyon: establishing a baseline study of the Redwood Canyon reach of Cerrito Creek in Blake Garden

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Understanding the Water, Understanding the Canyon

ESTABLISHING A BASELINE STUDY OF THE REDWOOD CANYON REACH OF CERRITO CREEK IN BLAKE GARDEN

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Abstract

This paper establishes a cross sectional baseline of the Redwood Canyon reach of Cerrito Creek in Blake Garden to be compared with future surveys and to assist with any decision making about the area by garden staff. We created a topographic survey of the main stream channel, historical and potential side channels and tributaries fllowing from neighboring properties. While the main stream channel is stable with a low seasonal flow, water entering the property from neighboring Jessen Court is sustpected to have caused damage leading to the removal of 2 large Redwoods and has the potential to cause more damage if these tributaries continue to incise and migrate.

Problem Statement

While the southern branch of the Cerrito Creek that runs through Blake Garden has been the subject of numerous studies and reports (Ludy 2007, Behrends 2007, Greenberg 2010, Sasaki 2018 & Barrera Lopez 2019), the north branch which runs through the Redwood Canyon has been mostly overlooked. With a low seasonal flow, the channel morphology is relatively stable compared to its counterpart on the southern edge of the property and has thus been deprioritized in terms of study. With new data, it could be helpful for the Blake Garden staff to make decisions on how to make changes and address the issues of illegal water diversion from neighboring properties on Jessen Court and causing potential damage to the century-old Redwoods and the path system in that area.

This project was developed with Timothy Cole, Blake Garden Horticulturist, who oversees this area of the Blake Garden.

Site Description

The Blake Garden sits in Kensington, CA. Kensington is an unincorporated residential community within Contra Costa County on the border of the City of Berkeley within Alameda County. The property, four miles north of the UC Berkeley campus, is owned and operated by the Department of Landscape Architecture and The College of Environmental Design as a public garden, outdoor laboratory, and teaching facility. Originally planned as a ceanothus wood, the Redwood Canyon was planted by Anita Blake and Mabel Symmes around 1920. The space was transformed into a shady redwood forest with rhododendrons and other moisture-loving understory plants.

The property declines over 100 feet in elevation over a horizontal distance of 750 feet, consistent with the topography of Kensington. Serpentine Rock lies beneath much of the garden and emerges at the eastern edge of the property. On the western slope of Blake Garden, a large outcropping of Lawsonite, a mineral known only to appear along the earth's fault lines, rises twenty feet (Eischid, 1999).

The Hayward Fault runs along the garden's northeastern property line. The garden is within the Alquist-Priola Special Study Zone, a fault area defined as highly susceptible to movement. The area is also within the Blakemont Slide Zone. The Blakemont Slide Zone is 19-acre residential area that was built over many small streams in the 1940s and 1950s. The ground movement in the Blakemont slide zone has destroyed several



Figure 1. Blakemont Slide Zone. Image: Kropp & Associates.

homes in the area and damaged many more. A home directly west of Blake Garden across Highgate Road has been

condemned. The tendency for earth movement at the site forces questions as to how these particular geologic conditions might influence the shape of the stream in addition to seasonal flows and human intervention.

Julian Waeber, Phd candidate in Geological Engineering at U.C. Berkeley, installed a device at the western edge of the property in 2012 to track the landslide in the garden. The solar powered device communicates with a satellite daily to track the amount of movement of the landslide. Also installed was a USGS seismograph to monitor the Hayward fault that runs through the upper part of the garden. The device has tracked an annual slide of approximately 4mm (Interview with Timothy Cole).

Figure 2. 1947 aerial photo of Kensington with Blake Garden property indicated. Image from Blake Garden: A History of Landscape Change, courtesy Pacific Aerial Surveys, Oakland, CA

Figure 3. 1959 aerial photo of Kensington with Blake Garden property indicated. Just 12 years later, we see an enormous amount of development in the post-war period. Image from Blake Garden: A History of Landscape Change, courtesy Pacific Aerial Surveys, Oakland, CA

Figure 4. 2019 aerial image of Kensington with Blake Garden property indicated. We see just a small amount of additional development from the 1959 image. Image from Google Earth.



During the post-war boom, the town of Kensington was rapidly developed into the residential community it is today. The rolling grassland became what is now estimated at 65% impervious surfaces (Sasaki, 2019). With the addition of sewer and drainage systems resulted in the diversion of water from the Redwood Canyon reach of Cerrito Creek resulting in a reduced flow into the Redwood Canyon reach of Cerrito Creek.

The development of the property below the Carmelite Monastery into Jessen Court has affected the hydrology of the site. The properties covered existing ponds and a stream that ran into the Redwood Canyon Reach (see Figure 6. Symmes plan). In 2007 there was an unresolved conflict between the garden and neighbors over the cause and responsibility for damage associated with changes in drainage. The redirected water resulted in the loss of two Coast Redwoods (Sequoia sempervirens) due to water damage to their roots. (Blake Garden archive).



Figure 5. Mabel Symmes' drawing of the Blake Properties. Anson Blake's home (now Blake Garden) on the right and Edwin Blake's home (now the Carmelite Monastery) on the left. Drawing circa 1922. Image from Blake Garden: A History of Landscape Change, courtesy of the College of Environmental Design Archives, Blake Garden Collection.

Figure 6. Inset of Symmes plan shows (1) spring above driveway that feeds the Redwood Canyon Reach. (2) The pond and stream where Jessen Court is now located. (3) The Redwood Canyon Reach formerly jogged to the northwest after the pool, where it now turns southwest.

Figure 7. Geologic map of the area around Blake Garden and its slide zones also shows springs in the area. (1) and (2) are located where the ponds below what is now the Carmelite Monastery and (3) spring located approximately located of water emerging beneath Cross Section E. . Image from Blake Garden: A History of Landscape Change, courtesy of the College of Environmental Design Archives, Blake Garden Collection.



The Symmes plan (circa 1922) provides insight to the conditions of the creek prior to the Jessen Court development. In the drawing, there are two ponds below the Edwin Blake home, now the Carmelite Monastery. Those ponds drain to a stream channel that meets the Redwood Canyon Reach on the Blake Garden Property in the area west of the Redwood Canyon. The drawing also shows that the Redwood Canyon reach formerly jogged to the northwest, exiting the property closer to the northwest corner of the property along what is now Highgate Road. The creek now jogs southwest below the pool exiting the property at a culvert that leads under Highgate.

A 2002 geologic report identifies a number of springs on the site and in the neighboring Jessen Court development. These springs are the source of flow in the main channel and in the tributary channels during the dry season. This map (Figure 7) correlates with the Symmes Plan (Figure 6). The geologic report states that a diminishing water table will likely reduce the flows coming from these springs in the future.

Methods

A cross section survey is designed to create a better understanding of the watercourse of the creek. The objective of our study was to establish baseline cross sections of the Redwood Canyon reach of Cerrito Creek in Blake Garden and to be compared with future surveys and serve as reference for monitoring incision at the small tributary streams. This data will assist with any decision making about the area by garden staff. We chose to complete a series of cross sections through the portion of the creek that falls within the Redwood Canyon. Beyond the Redwood Canyon to the western fence line, the creek drops into a heavily vegetated ephemeral wetland that would have been extremely difficult to accurately survey with limited time and hands.

The goal was to complete a survey that encompassed the main creek and the area of the small tributaries originating in the area that was built over during the Jessen Court development. Fourteen section lines were spaced out perpendicularly to the creek and labeled A to K for the main channel and Tributary 1-3 for the small streams at the northern fence line (Appendix A). We selected sections that were representative of the flow changes at multiple elevations and captured areas of change between the channel and the property line. To do this all cross sections run from fence on the northern side of the property across the stream channel to a marker at, roughly, the same elevation (Harrelson, 1994). Measurement were taken at any visible change in slope and/or permanent feature (i.e. path). Cross sections were measured using a domed tri-pod (Forestry Service, Inc), level (Leitz) and a 16.5 foot surveying rod. Flags were temporarily used to mark sections and instrument stations. As a reference for future research, these temporary flags will be replaced shortly with permanent, labeled rebar markers.

Due to the current Corona virus restrictions, access to the garden and neighboring properties was limited. Following these restrictions there are plans for a longitudinal study and to measure the flows from the springs on the garden property and in the neighboring Jessen Court properties. Pebble counts were not undertaken. The stream is essentially dammed and is starved for pebbles and cobble. The stream channel is filled with leaf litter and the pools with ultra-fine sediment.

Field work took place on November 8, 15, 22, and 29, 2020, late in the dry season. The surveying team was comprised of the paper's authors and Timothy Cole, Blake Garden Horticulturist. We also had extensive conversation with Cole about the garden and his experiences observations of the main channel and tributaries.

Results

As the main stream channel is dry most of the year and receives relatively low flows in the rainy season, the channel has remained stable for many decades. The cross sections did help discern the form of the Redwood Canyon in areas with dense vegetation can obscure the topography. One such area are the low points between the channel and the fence line in sections I, J and K which appear to likely the former stream channel seen in the Symmes plan that connected the springs and ponds below the Carmelite Monastery to the Redwood Canyon reach.



Figure 8. Compiled cross sections for main stream channel with thalwegs aligned.

The following cross sections show the small tributaries and how the water is entering the property at the fence line adjacent to 22 Jessen Court. Two streams (Trib 2 & 3) enter from the fence before merging into one stream (Trib 1) that runs into the first pool.

Cross Section Trib1 (see Appendix B for individual cross sections) shows incision of just under one foot (.8 and .95). There is undercutting along the channel, which could impact the redwood to the south of the channel if the undercutting continued and the channel migrated.

During high intensity storms, the path between station points 5-10 floods from water that is seeping under the current berms. Cross Section Trib3 shows where water moves around the trees to the low point at station point 22.. The cross section reveals how flat the slope is in this area which is difficult to discern with the eye.



Section Length

Figure 9. Compiled cross sections for Tributaries 1 and 2 which run parallel to the main stream channel.



Figure 9. Compiled cross sections for Tributaries 1 and 2 which run parallel to the main stream channel.

Discussion

The cross section measurements provide valuable information about the Redwood Canyon, but further direct examination or survey on neighboring properties could locate the perennial spring sources and measure their flows, both in the dry and rainy seasons.

Garden staff will need more analysis to decide whether to armor these new channels to protect the trees in this novel ecosystem or to let the incisions continue and let the channel migrate on its own, potentially damaging other trees' roots.

Conclusion

As a preliminary study of the Redwood Canyon and its reach of Cerrito Creek, our research represents a first pass at understanding the form of the area. While the flows (Appendix D) into the creek are small relative to the major drainage on the other side of the garden, they are not insignificant and have already resulted in loss of some of the garden's beloved coast redwoods. Cross Section Tributary 1 (Figure 15), shows incision in the small but newly formed reach which threatened two more redwoods and could potentially incise, erode, and undercut more with heavy seasonal flows.

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Appendix A



Map of Blake Garden and diagram and sections cut across stream channel.

Appendix B







Appendix C

Cross Section A

HI1	Elevation	STN.	ROD	ANGLE	Station	Elevation	Notes
4.41	567.11	0.0	-2.82	0	0.0	570.00	
		10.0	-1.38	355	10.0	571.44	

13

14.0	-2.18	339	14.0	570.64	Top of bank
25.0	-5.68	323	25.0	567.14	Stream channel center
26.5	-5.72	321	26.5	567.10	
30.5	-4.36	316	30.5	568.46	Fence line

Runs from a young Prunus cerasifera to the first corner along the monastery property line across ivy (Hedera spp.).

Cross	Section	В
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HI1		stn.	ROD	ANGLE	Station	Elevation	
4.41	567.11	0.0	-5.14	109	0.0	567.68	
		25.0	-5.82	176.7	25.0	567.00	
		32.0	-6.61	205	32.0	566.21	
		37.0	-8.49	225	37.0	564.33	
		42.0	-11.11	235	42.0	561.71	Stream channel edge
		43.0	-11.04	237	43.0	561.78	Stream channel edge
		47.0	-9.99	242.5	47.0	562.83	
		52.0	-7.88	248	52.0	564.94	
		57.0	-5.71	252	57.0	567.11	
		59.0	-5.51	253	59.0	567.31	Fence line

From base of Dodonea viscosa tree, through patch of Dietes varieties, across stream channel with Clivia to fence.

HI2		stn.	ROD	ANGLE	Station	Elevation	
3.21	553.63	0.00	-1.49		0.0	551.64	
		13.00	-3.05		13.0	550.08	
		23.00	-6.26		23.0	546.87	
		25.00	-7.3		25.0	545.83	
		27.00	-8.41		27.0	544.72	Stream channel edge
		28.00	-8.55		28.0	544.58	Stream channel edge
		31.00	-6.89		31.0	546.24	
		33.50	-5.83		33.5	547.30	Edge of path
		37.50	-5.15		37.5	547.98	

Cross Section C

43.50	-2.77	43.5	550.36	
56.00	-2.19	56.0	550.94	
69.50	-1.29	69.5	551.84	Fence line

From base of young Port Orford Cedar (Chamaecyparis lawsoniana), through patch of mixed varieties, across stream channel with Clivia to fence.

Cross Section D

HI3		stn.	ROD	ANGLE	Station	Elevation	Notes
3.33	544.83	0.00	-2.12	211.00	0.0	542.71	
		13.50	-2.87	181.5	13.5	541.96	
		17.00	-3.62	174	17.0	541.21	
		23.00	-7.79	159	23.0	537.04	
		28.00	-11.61	148	28.0	533.22	
		30.00	-11.56	144	30.0	533.27	Stream channel bottom
		35.00	-8.95	137	35.0	535.88	
		38.00	-6.27	133	38.0	538.56	Base of Redwood
		42.50	-4.83	128	42.5	540	
		51.00	-4.13	121	51.0	540.7	Middle of path, 3' wide/4.5' on diagonal
		55.00	-3.39	118	55.0	541.44	
		79.00	-1.51	108	79.0	543.32	Fence line

From base of young Monterrey Cypress (Hesperocyparis macrocarpa), through patch of Dietes varieties, across stream channel with Clivia to fence. Redwood Sorrel (Oxalis oregana) on banks.

Cross Secti	on E						
HI3		STN.	ROD	ANGLE	Station	Elevation	Notes
3.33	544.83	0.00	-0.39	0	0.0	543.44	
		7.00	-1.8	340	7.0	542.03	
		14.00	-4.91	314	14.0	538.92	
		26.50	-13.42	279	26.5	530.41	Actively eroding
		28.00	-13.63	276	28.0	530.2	
		29.00	-13.47	274	29.0	530.36	

39.00	-7.84	262	39.0	535.99	
55.00	-4.23	253	55.0	539.6	
63.50	-3	250	63.5	540.83	Edge of stair
68.00	-3.4	249	68.0	540.43	Bottom of Step
69.00	-1.96	247	69.0	541.87	
76.00	-2.86	248	76.0	540.97	On the stair

From base of large Coast Redwood (Sequoia sempervirens), across stream channel with Redwood leaf litter. African Broom Fern (Asparagus virgatus), English Holly (Ilex aquifolium), snowberry (Symphoricarpos albus) and Ocean Spray Cream Bush (Holodiscus discolor) on banks. Just below Cross Section E water appears in the stream channel

Cross Section F

HI4		stn.	ROD	ANGLE	Station	Elevation	Notes
4.10	543.83	0.00	-6.5	0.00	0.0	537.33	Along path
		9.00	-6.98	18	9.0	536.85	Along path
		20.00	-10.26	67.5	20.0	533.57	Along path
		34.00	-14.3	102	34.0	529.53	
		35.00	-14.56	103	35.0	529.27	Stream channel, first wet area (below fault)
		36.00	14.84	106		558.67	Top of incision
		36.00	-15.45	106	36.0	528.38	Bottom of incision
		38.00	-15.42	107	38.0	528.41	Bottom of incision
		38.50	-14.7	109	38.5	529.13	Top of incision
		41.50	-13.95	112	41.5	529.88	
		49.50	-12.24	118	49.5	531.59	Next to steps down (L)
		50.50	-12.14	119	50.5	531.69	
		54.00	-12.06	120.5	54.0	531.77	
		54.50	-11.65	120.5	54.5	532.18	
							Red cestrum from here to fence. Hard to
		66.00	-11.82	124	66.0	532.01	visibly detect grade change due to dense vegetation.
		70.00	-11.84	124	70.0	531.99	
		74.00	-12.06	125	74.0	531.77	

Appears to be bottom of dominant channe in this area.		531.58	76.0	125	-12.25	76.00
		531.6	78.0	125	-12.23	78.00
Zealand Lacebacks (Hoheria ~10yrs. Drip line of trunk at 80.5	(2) Nev populne	532.03	80.0	125	-11.8	80.00
		532.45	84.0	126	-11.38	84.00
		532.42	88.0	126.5	-11.41	88.00
		532.64	92.0	126.9	-11.19	92.00
	Fence li	533.43	96.0	127	-10.4	96.00

From base of sprinkler on main path, across stream channel with Redwood leaf litter. Five Finger Fern (Adiantium aleuticum), Wild Ginger (Asarum caudatum), Holly Leaf Cherry Tree (Prunus Ilicifolia) on banks. From path to fence, dense thicket of Red Cestrum (Cestrum newellii).

Cross Section G

HI5

2.63	529.13	stn.	ROD	ANGLE	Station	Elevation	Notes
		0.00	1.14		0.0	530.27	
		13.00	-2.74	0	13.0	526.39	
		24.00	-5.95	28	24.0	523.18	S. edge of path
		33.00	-5.86	55	33.0	523.27	Still on path
		33.50	-6.21	55.5	33.5	522.92	Jusat off path
		42.00	-8.56	74	42.0	520.57	In bankfull area/clivia escarpment
		48.50	-11.04	85	48.5	518.09	Top of bank -> small incision
		49.50	-11.41	86	49.5	517.72	Stream bed
		52.50	-11.58	89.5	52.5	517.55	End of apparent stream bed.
		54.50	-10.94	92	54.5	518.19	Just out of channel
		60.00	-8.48	96	60.0	520.65	Redwood between 59.5-60.5
		71.50	-4.5	104	71.5	524.63	S. edge of path
		76.50	-4.1	105.5	76.5	525.03	
		83.00	-2.55	108	83.0	526.58	
		85.00	-2.63	108	85.0	526.5	Fence line

From base of Coast Redwood (Sequoia sempervirens), down slope of Lady Fern (Athyrium filix-femina) and Ladder Fern (Nephrolepis cordifolia) across stream channel with Redwood leaf litter, Clivia and Oxalis.

Cross Section H

HI5

2.63	529.13	stn.	ROD	ANGLE	Station	Elevation	Notes
		0.00	-5.64	15	0.0	523.49	
		2.00	-6.13	17.5	2.0	523	
		2.50	-6.82	18.25	2.5	522.31	Inside south of path
		8.00	-6.81	27	8.0	522.32	Other side of path
		20.00	-9.23	44.5	20.0	519.9	
		24.00	-10.76	51	24.0	518.37	
		26.50	-12.73	54	26.5	516.4	Actively eroding at edge of pool
		39.00	-12.76	67	39.0	516.37	Pool depth varies slightly, between 1-2". Fine muck
		40.00	-12.1	68.5	40.0	517.03	
		45.50	-10.82	73	45.5	518.31	Redwood's lowside center 1.5" to the west. 45'-48.5'
		50.00	-9.26	77	50.0	519.87	High side
		53.00	-8.81	79	53.0	520.32	Log 50.5-53' at edge of path.
		59.00	-6.03	84.5	59.0	523.1	Edge of path
		68.50	-5.2	87	68.5	523.93	
		72.00	-5.23	89	72.0	523.9	Top of log
		72.70	-6	89	72.7	523.13	Undercut back to 72.5
		74.00	-5.87	89.5	74.0	523.26	
				\A/ator	76 7	516 4	
				vvaler	20.2	5147	
					37.3	J10.0	

From base of sprinkler on main path, down slope of Lady Fern (Athyrium filix-femina) and Ladder Fern (Nephrolepis cordifolia) across stream channel with Redwood leaf litter, Clivia and Oxalis oregana. Between pool and fence, Ruscus (Ruscus hypoglossum).

Cross Section I

2.63	529.13	STN.	ROD	ANGLE	Station	Elevation	Notes
		0.00	-10.6	28	0.0	518.53	Edge of path
		2.00	-11.32	29	2.0	517.81	Edge of planting bed
		2.80	-12.47	29	2.8	516.66	S. edge of path
		6.00	-12.43	31.5	6.0	516.7	
		10.00	-10.91	33	10.0	518.22	
		20.00	-13.06	39.5	20.0	516.07	Depression
		22.00	-12.89	40.5	22.0	516.24	Top of bank
		22.50	-13.41	40	22.5	515.72	
		23.50	-13.38	41	23.5	515.75	
		24.00	-13.01	42	24.0	516.12	
		25.70	-13	43	25.7	516.13	Edge of channel
		27.00	-12.44	44	27.0	516.69	Bed area
		37.00	-11.49	50	37.0	517.64	Edge of path
		40.00	-11.77	52	40.0	517.36	
		45.00	-10.32	55	45.0	518.81	
		56.50	-8.88	62	56.5	520.25	Edge of path
		59.00	-8.84	63	59.0	520.29	Edge of path
		67.50	-7.42	68	67.5	521.71	
		72.50	-7.32		72.5	521.81	Depression
		76.00	-6.62		76.0	522.51	
		78.00	-6.87	73	78.0	522.26	
		81.00	-6.74	75	81.0	522.39	

From base of sprinkler on main path. Mostly leaf litter floor with some Wild Ginger and Calla Lily at edge of pool. Between pool and fence, Ruscus (Ruscus hypoglossum and Ruscus ruscifolium).

Cross Section	on J						
HI6							
3.75	524.14	STN.	ROD	ANGLE	Station	Elevation	Notes
		0.00	-6.82	0	0.0	517.32	

HI5

5.00	-8.28	2	5.0	515.86	End of bed
5.50	-9.03	2.5	5.5	515.11	Edge of path
8.50	-9.09	5	8.5	515.05	
17.00	-9.32	7	17.0	514.82	
17.50	-9.82	7.5	17.5	514.32	Rock edge, likely submerged when flooded.
19.00	-9.91	8	19.0	514.23	Edge of pool
19.50	-10.89	8	19.5	513.25	Water depth .8 ft.
22.00	-11.59		22.0	512.55	Center
26.00	-9.59		26.0	514.55	
27.00	-9.19		27.0	514.95	
28.00	-9		28.0	515.14	
31.00	-9.19	15	31.0	514.95	Edge of path
34.00	-9.21	17	34.0	514.93	
42.00	-8.89	23	42.0	515.25	
50.00	-6.82	32	50.0	517.32	
58.00	-6.93	42	58.0	517.21	Edge of path
62.00	-7.52	47	62.0	516.62	Other edge of path
73.00	-7.73	65.5	73.0	516.41	Redwood diam from 67-70, center at 68.5,1.25' from tape west to redwood
80.00	-7.64	77	80.0	516.5	
90.00	-8.83	92	90.0	515.31	
94.00	-9.32	96.5	94.0	514.82	Fence line

From base of rock outcrop on main path. Through patch of a variety of irises (Iris douglasiana, Iris confusa, Iris foetidissima) and other bulbs. Between stream channel and fence, Ruscus (Ruscus hypoglossum).

Cross Section K

HI6

3.75	524.14	STN.	ROD	DTT	ANGLE	Station	Elevation	Notes
		0.00	-10.21		18	0.0	513.93	
		1.50		-0.9		1.5	513.54	
		4.00		-1.2		4.0	513.24	

5.00		-1		5.0	513.44	
8.00		-0.9		8.0	513.54	
13.00	-10.73		25	13.0	513.41	Top of bank
13.60	-11.6		25	13.6	512.54	In the channel, armored flagstone
14.30	-11.9		25	14.3	512.24	Other side of channel
15.00	-10.89		25.25	15.0	513.25	Top of bank
19.00		-0.7		19.0	513.74	
24.00	-11.2	-1.2	32.00	24.0	512.94	Edge of path
27.00	-11.22		34	27.0	512.92	
52.00	-12.9		54	52.0	511.24	Honeysuckle bed east of path
60.50	-11.95		63	60.5	512.19	Tree east of tape from 57-60.6
64.00	-12.24	-2.24	66.00	64.0	512.2	
78.00		-1.8		78.0	512.64	
88.00		-2.75		88.0	511.69	
90.00		-3		90.0	511.44	Fence line

From base of rock outcrop on main path. Through patch of a variety of dianella, Japanese Anemone (Anemone hupehensis), Trident Maple (Acer Buergerianum), Kousa Dogwood (Cornus kousa)., Ruscus (Ruscus hypoglossum and Ruscus ruscifolium) along fence. Stream Channel is armored in this stretch with large stones, likely from elsewhere on the site.

Cross Sec 1	tion Tribuary							
HI6								
3.75	524.14	stn.	ROD	DTT	ANGLE	Station	Elevation	Notes
		0.00	-2.21		275.00	0.0	521.93	
		13.50	-3.86		284.00	13.5	520.28	
		15.60	-4.48		284.00	15.6	519.66	Edge of channel
		15.80	-5.26		285.00	15.8	518.88	incision
		16.50	-4.78		285.00	16.5	519.36	top of raock in channel center. Large rock, attempt to secure channel?
		16.80	-5.5		285.00	16.8	518.64	Back down into incision
		17.00	-4.55	-2	285.00	17.0	519.59	Undercut ~1"
		22.00		-1		22.0	520.59	

25.50	-3.44	293.00	25.5	520.7

Cross Section Tribuary

2

HI6

3.75	524.14	STN.	ROD	DTT	ANGLE	Station	Elevation	Notes
		0.00		-2.2		0.0	519.78	On a redwood rootball
		2.50		-2.7		2.5	519.28	Redwood log/berm
		5.00	-4.96	-2.8	284.00	5.0	519.18	other side of redwood log/berm
		9.00	-4.72		281	9.0	519.42	Edge of path
		11.90	-3.85		279	11.9	520.29	Dropping off a root
		12.00	-3.53		278.5	12.0	520.61	On a root(root runs perp to cross section)
		18.00	-1.78		272	18.0	522.36	
		23.20	-1.39		268	23.2	522.75	Up on log/berm
		23.30	-2.08		268	23.3	522.06	Still in channel
		24.00	-2.15		267	24.0	521.99	Living root in bottom of chanel
		24.20	-2.09		267	24.2	522.05	in the channel
		24.80	-1.75		266	24.8	522.39	bank of channel
		28.00	-1.69		262.5	28.0	522.45	
Cross Sec 3 HI6	tion Tribuary							
3.75	524.14	stn.	ROD	DTT	ANGLE	Station	Elevation	Notes
		0.00	-1.69		262.50	0.0	522.45	
		7.00	-1.89		261.50	7.0	522.25	
		8.50	-2.23		261.00	8.5	521.91	Foundation of fence port. Broken, not flat concrete.

9.00 -2.49 261.00 9.0 521.65 Off of the concrete, into the water Channel filled with softball sized rock placed 521.57 by someone. Site rock not from stream 11.00 -2.57 260.50 11.0 521.58 Edge of channel 13.00 -2.56 260.25 13.0

22

1700 -2 259.00 17.00 52.14 1800 -229 258.50 18.00 521.85 1900 -2.48 258.00 19.00 521.66 2600 -2.45 254.00 26.00 521.65 33.00 -2.49 246.00 33.00 521.65 4.00 -4.73 162.00 30.00 521.65 7000 -2.49 246.00 30.00 519.41 Cross Section A			15.00	-2.01		259.50	15.0	522.13	Top of bank
1800-2.29-28.5018.00521.651900-2.48-254.0026.00521.693300-2.49-246.0033.00521.6549.00-4.73-162.0049.00519.41Cross Section A			17.00	-2		259.00	17.0	522.14	
19:00-2:48-258:0019:00521:6626:00-2:49-254:0026:00521:6933:00-2:49-246:0033:00521:6549:00-4:73-162:0049:00519:41Cross Section ASTNRODANGLEStationElevation14:1567.1100-2:8200570:0010:0-1:3835510:0571:44Top of bank10:0-1:3835510:0567:14Stream channel center26:55:57:232:126:55:67:10Stream channel center26:55:7232:126:55:67:10Fence lineCross Section BSTNRODANGLEStationElevation4:415:67:110:0-5:141090:05:66:2120:0-6:612053:705:67:10Stream channel center4:415:67:110:0-5:141090:05:67:6821:0-6:123:705:62:13Stream channel edge4:115:70-5:12:35:05:67:104:415:70-5:12:55:705:61:14:415:70-5:12:55:705:61:14:415:70-5:12:55:705:61:14:415:70-5:12:55:705:61:14:415:70-5:12:55:705:714:50-5:12:55:705:7			18.00	-2.29		258.50	18.0	521.85	
26.00 -2.45 254.00 26.00 521.69 33.00 -2.49 246.00 33.00 521.65 49.00 -4.73 162.00 49.00 519.41 Cross Section A			19.00	-2.48		258.00	19.0	521.66	
3300 -2.49 246.00 33.0 521.65 49.00 -4.73 -162.00 49.0 519.41 Cross Section A STN ROB ANGLE Statuon Elevation Notes 4.41 567.11 0.00 -2.82 0 0.00 570.00 Top of bank 4.41 567.11 0.00 -2.82 0 0.00 570.60 Top of bank 25.0 -5.68 323 25.0 567.10 Stram channel center 26.5 567.10 30.0 571.64 Stram channel center Fence line Cross Section B STN ROD ANGLE Statuon Elevation Stream channel edge 4.41 567.11 0.00 -5.14 109 0.00 567.68 Stream channel edge 4.41 567.11 0.00 -5.14 109 0.00 567.68 Stream channel edge 3.20 -6.61 205 3.20 566.21 Stream channel edge Stream channel edge			26.00	-2.45		254.00	26.0	521.69	
49.00 4.73 162.00 49.0 519.41 Cross Section A STN. ROD $ANGE$ $Station$ Elevation $Notes$ 4.41 567.11 0.0 -282 0 0.0 570.00 Top of bank 4.41 567.11 0.0 -2.82 0.0 570.64 Top of bank 25.0 -5.68 323 25.0 567.14 570.64 70.96 25.0 -5.68 323 25.0 567.14 70.96 70.96 25.0 -5.68 37.3 26.5 567.10 70.96 70.96 441 567.11 0.0 -5.14 100 0.0 567.68 70.00 567.68 441 567.11 0.0 -5.14 106 20.5 566.21 77.00 564.33 441 567.11 0.0 -5.14 225 37.00 564.31 77.00 8.49 520.5 567.11 77.00 77.00 567.31 77.00			33.00	-2.49		246.00	33.0	521.65	
Section A STN. ROD ANGLE Station Elevation Notes 4.41 567.11 0.0 -2.82 0 0.0 570.00			49.00	-4.73		162.00	49.0	519.41	
H11 Elevation STN. ROD ANGLE Station Elevation Notes 4.41 567.11 0.0 -2.82 0 0.0 570.00 Top of bank 10.0 -1.38 355 10.0 571.44 Top of bank 25.0 -5.68 323 22.0 567.10 Stream channel center 26.5 -5.72 231 26.5 567.10 Stream channel center 4.41 567.11 0.0 -5.14 109 0.0 567.68 Cross Section B FI11 567.11 0.0 -5.14 109 0.0 567.68 4.41 567.11 0.0 -5.14 109 0.0 567.81 250 -5.82 1767 25.0 567.00 567.81 547.11 Stream channel edge 4.41 567.11 0.0 -5.14 109 561.78 5tream channel edge 4.40 -11.01 235 520 567.31 Fence line	Cross	Section A							
4.41 567.11 0.0 -2.82 0 0.0 570.00 10.0 -1.38 335 10.0 571.44 Top of bank 25.0 -5.68 323 25.0 567.14 Stream channel center 26.5 -5.72 321 26.5 567.10 Stream channel center 26.5 -5.72 321 26.5 567.10 Stream channel center 26.5 -5.72 321 26.5 567.10 Stream channel center 30.5 -4.36 316 30.5 568.46 Fence line Cross Section B STN. ROD ANGLE Station Elevation 4.41 567.11 0.0 -5.14 109 0.0 567.68 25.0 -5.82 176.7 25.0 567.0 32.0 66.1 32.0 -6.41 205 32.0 561.71 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 52.0 567.11 52.0 -7.88 248 52.0 564.94 57.0 567.1	HI1	Flevation	STN.	rod	ANGI F	Station	Flevation		Notes
A.1. 50.11 100 -1.38 355 100 571.44 140 -2.18 339 14.0 570.64 Top of bank 250 -5.68 323 25.0 567.14 Stream channel center 26.5 -5.72 321 26.5 567.10 Stream channel center 4.41 567.11 0.0 -5.14 109 0.0 567.88 25.0 -5.82 176.7 25.0 567.00 32.0 566.21 37.0 -8.49 225 37.0 564.33 Stream channel edge 47.0 -11.11 237 43.0 561.71 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 Stream channel edge 32.0 -5.51 253 59.0 567.31 Fence line	4 4 1	56711	00	-2.82	0	0.0	570.00		
Cross Section B STN. ROD ANGLE Station Elevation 4.41 567.11 STN. ROD ANGLE Station Elevation 4.4.1 567.11 0.0 -5.48 316 30.5 568.46 Fence line Cross Section B STN. ROD ANGLE Station Elevation 4.41 4.4.1 567.11 0.0 -5.42 176.7 25.0 567.00 32.0 -6.61 205 32.0 566.21 37.0 564.33 42.0 -11.11 235 42.0 561.71 Stream channel edge 47.0 -9.99 242.5 37.0 566.31 Stream channel edge 47.0 -9.99 242.5 57.0 567.11 Stream channel edge 57.0 -5.51 253 59.0 567.31 Fence line Cross Section C H12 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 3.30 -5		307.11	10.0	-1 38	355	10.0	57144		
Cross Section B STN. ROD ANGLE Station Elevation 4.41 567.11 STN. ROD ANGLE Station Elevation 4.41 567.11 0.0 -5.14 109 0.0 567.68 4.41 567.11 0.0 -5.14 109 0.0 567.68 25.0 -5.67.11 0.0 -5.14 109 0.0 567.68 4.41 567.11 0.0 -5.14 109 0.0 567.68 25.0 -6.61 205 32.0 566.21 37.0 8.49 20.0 -11.11 235 42.0 561.71 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 567.31 Stream channel edge 50.0 -7.78 248 52.0 567.31 Fence line 551.64 12 STN. ROD ANGLE Station Elevation 51.64 3.21 553.63 0.00 -1.49 0.0 551.64 50.08 23.00 -6.26 23.			14.0	-2.18	339	14.0	570.64		Top of bank
26.5 -5.72 321 26.5 567.10 30.5 -4.36 316 30.5 568.46 Fence line Cross Section B Fl1 STN. ROD ANGLE Station Elevation 4.41 567.11 0.0 -5.14 109 0.0 567.68 25.0 -5.82 176.7 25.0 567.00 32.0 566.21 37.0 -8.49 225 37.0 564.33 Stream channel edge 43.0 -11.11 237 43.0 561.78 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 Stream channel edge 50.0 -5.51 253 59.0 567.31 Fence line Cross Section C HI2 STN. ROD ANGLE Station Elevation 3.21 553.63 0.0 -1.149 0.0 551.64 3.20 -6.26 23.0 546.87 25.00 7.73 25.0 547.31 12 STN. ROD ANGLE Station			25.0	-5.68	323	25.0	56714		Stream channel center
Cross Section B STN. ROD ANGLE Station Elevation 4.41 567.11 00 -5.14 109 0.0 567.68 4.41 567.11 00 -5.14 109 0.0 567.68 25.0 -5.82 176.7 25.0 567.00 32.0 566.21 37.0 -8.49 225 37.0 564.33 561.71 Stream channel edge 43.0 -11.04 237 43.0 561.78 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 Stream channel edge 57.0 -5.71 252 57.0 567.11 Fence line Cross Section C HI1 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 550.08 3.20 -6.26 23.0 546.87 550.08 2500 7.3 250 545.83 3.20 -6.26 23.0 545.83 Stream channel edge 21.00 546.			25.0	-5 72	323	25.0	567.10		Stream channel center
Cross Section B STN. ROD ANGLE Station Elevation 4.41 567.11 0.0 -5.14 109 0.0 567.68 25.0 -5.82 176.7 25.0 567.00 32.0 -6.61 205 32.0 566.21 37.0 -8.49 225 37.0 564.33 42.0 -11.11 235 42.0 561.71 Stream channel edge 43.0 -11.04 237 43.0 561.78 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 Stream channel edge 57.0 -5.71 252 57.0 567.11 567.61 59.0 -5.51 253 59.0 567.31 Fence line Cross Section C HI2 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 3.300 -6.26 23.0 546.87 25.0 545.83 2.700 -8.41 27.0 544.72			20.5	_4 36	316	20.5	568.46		Fence line
Cross Section B STN. ROD ANGLE Station Elevation 4.41 567.11 00 -5.14 109 0.0 567.68 25.0 -5.82 176.7 25.0 567.00 32.0 -6.61 205 32.0 566.21 37.0 -8.49 225 37.0 564.33 42.0 -11.11 235 42.0 561.71 Stream channel edge 43.0 -11.04 237 43.0 561.78 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 Stream channel edge 57.0 -5.51 253 59.0 567.31 Fence line Elevation STN. ROD ANGLE Station Elevation Strix ROD ANGLE Station Stream channel edge 3.21 53.63 0.00 -1.49 0.0 551.64 3.30 -6.26 23.0 546.87 250.0 554.83 2.300 -6.26 23.0 551.64 <			50.5	1.50	510	50.5	500.10		
H11 STN. ROD ANGLE Station Elevation 4.41 567.11 0.0 -5.14 109 0.0 567.68 25.0 -5.82 176.7 25.0 567.00 32.0 -6.61 205 32.0 566.21 37.0 -8.49 225 37.0 564.33 42.0 -11.11 235 42.0 561.71 Stream channel edge 43.0 -11.04 237 43.0 561.78 Stream channel edge 47.0 9.99 242.5 47.0 562.83 Stream channel edge 57.0 -5.71 252 57.0 567.11 Fence line Elevation STN. ROD ANGLE Station Elevation Stream channel edge 3.21 553.63 0.00 -1.49 0.0 551.64 3.20 -5.51 25.0 25.0 546.87 25.00 -7.3 25.0 546.87 25.0 25.00 -7.3 25.0 544.72	Cross	Section B							
4.41 567.11 0.0 -5.14 109 0.0 567.68 25.0 -5.82 176.7 25.0 567.00 32.0 -6.61 205 32.0 566.21 37.0 -8.49 225 37.0 564.33 42.0 -11.11 235 42.0 561.71 Stream channel edge 43.0 -11.04 237 43.0 561.78 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 Stream channel edge 57.0 -5.71 252 57.0 567.11 Stream channel edge 59.0 -5.51 253 59.0 567.31 Fence line Cross Section C H12 STN. ROD ANGLE Station Elevation 321 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08 23.00 64.26 25.00 -7.3 25.0 546.87 25.00 544.58 26.00 -7.3 25.0 544.58	HI1		stn.	ROD	ANGLE	Station	Elevation		
250 -5.82 176.7 25.0 567.00 320 -6.61 205 32.0 566.21 37.0 -8.49 225 37.0 564.33 42.0 -11.11 235 42.0 561.71 Stream channel edge 43.0 -11.04 237 43.0 561.78 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 Stream channel edge 57.0 -5.71 252 57.0 567.11 Fence line 59.0 -5.51 253 59.0 567.31 Fence line Cross Section C H12 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 3.20 -6.26 23.0 546.87 550.08 25.00 -7.3 25.0 545.83 Stream channel edge 26.00 -8.55 28.0 544.58 Stream channel edge 31.00 -6.89 31.0 546.24 Stream channel edge <t< td=""><td>4.41</td><td>567.11</td><td>0.0</td><td>-5.14</td><td>109</td><td>0.0</td><td>567.68</td><td></td><td></td></t<>	4.41	567.11	0.0	-5.14	109	0.0	567.68		
32.0 -6.61 205 32.0 566.21 37.0 -8.49 225 37.0 564.33 42.0 -11.11 235 42.0 561.71 Stream channel edge 43.0 -11.04 237 43.0 561.78 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 Stream channel edge 57.0 -5.71 252 57.0 567.11 Stream channel edge 57.0 -5.51 253 59.0 567.31 Fence line Cross Section C H12 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08 23.00 546.87 25.00 -7.3 25.0 545.83 Stream channel edge 21.00 -8.41 27.0 544.72 Stream channel edge 28.00 -8.55 28.0 544.58 Stream channel edge 31.00 -6.89 31.0 546.24 Stre			25.0	-5.82	176.7	25.0	567.00		
37.0 -8.49 225 37.0 564.33 42.0 -11.11 235 42.0 561.71 Stream channel edge 43.0 -11.04 237 43.0 561.78 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 Stream channel edge 52.0 -7.88 248 52.0 564.94 Stream channel edge 57.0 -5.71 252 57.0 567.11 Stream channel edge 6.0 -5.51 253 59.0 567.31 Fence line Cross Section C HI2 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08 23.00 -6.26 23.0 546.87 25.00 -7.3 25.0 545.83 Stream channel edge 28.00 -85.5 28.0 544.58 Stream channel edge 28.00 -85.5 28.0 544.58 Stream channel edge 31.0 -64.24 33.50 <td></td> <td></td> <td>32.0</td> <td>-6.61</td> <td>205</td> <td>32.0</td> <td>566.21</td> <td></td> <td></td>			32.0	-6.61	205	32.0	566.21		
42.0 -11.11 235 42.0 561.71 Stream channel edge 43.0 -11.04 237 43.0 561.78 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 Stream channel edge 52.0 -7.88 248 52.0 564.94 Stream channel edge 57.0 -5.71 252 57.0 567.11 Fence line Cross Section C H12 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08 23.0 546.87 25.00 -7.3 25.0 545.83 24.00 44.58 27.00 -8.41 27.0 544.72 Stream channel edge 28.00 -8.55 28.0 544.58 Stream channel edge 31.00 -6.89 31.0 546.24 31.00 46.24 33.50 -5.83 33.5 547.30 Edge of path 37.50 -5.15 37.5 </td <td></td> <td></td> <td>37.0</td> <td>-8.49</td> <td>225</td> <td>37.0</td> <td>564.33</td> <td></td> <td></td>			37.0	-8.49	225	37.0	564.33		
43.0 -11.04 237 43.0 561.78 Stream channel edge 47.0 -9.99 242.5 47.0 562.83 52.0 -7.88 248 52.0 564.94 57.0 -5.71 252 57.0 567.11 59.0 -5.51 253 59.0 567.31 Fence line Cross Section C H12 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08 23.00 6-26 23.0 546.87 25.00 -7.3 25.0 545.83 27.00 -8.41 27.00 544.72 Stream channel edge 28.00 -8.55 28.0 544.58 Stream channel edge 31.00 -6.89 31.0 546.24 33.50 547.30 Edge of path 37.50 -5.15 37.5 547.98 43.5 550.36 550.36			42.0	-11.11	235	42.0	561.71		Stream channel edge
47.0 -9.99 242.5 47.0 562.83 52.0 -7.88 248 52.0 564.94 57.0 -5.71 252 57.0 567.11 59.0 -5.51 253 59.0 567.31 Fence line Cross Section C H12 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08 23.00 -6.26 23.0 546.87 25.00 -7.3 25.0 545.83 27.00 -8.41 27.0 544.72 Stream channel edge 31.00 -6.89 31.0 546.24 Stream channel edge 31.00 -6.89 31.0 546.24 Stream channel edge 31.00 -6.89 31.0 546.24 Stream channel edge 31.00 -5.83 33.5 547.30 Edge of path 37.50 -5.15 37.5 547.98 Edge of path			43.0	-11.04	237	43.0	561.78		Stream channel edge
52.0 -7.88 248 52.0 564.94 57.0 -5.71 252 57.0 567.11 59.0 -5.51 253 59.0 567.31 Fence line Cross Section C H12 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08			47.0	-9.99	242.5	47.0	562.83		
57.0 -5.71 252 57.0 567.11 59.0 -5.51 253 59.0 567.31 Fence line Cross Section C H12 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08 23.00 6.26 23.00 -6.26 23.0 546.87 25.00 7.7.3 25.00 -7.3 25.0 544.72 Stream channel edge 28.00 -8.55 28.0 544.58 Stream channel edge 31.00 -6.89 31.0 546.24 33.50 547.30 33.50 -5.83 33.5 547.30 Edge of path 37.50 -5.15 37.5 547.98 Edge of path			52.0	-7.88	248	52.0	564.94		
59.0 -5.51 253 59.0 567.31 Fence line Cross Section C H12 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08 23.00 -6.26 23.0 546.87 25.00 -7.3 25.0 545.83 27.00 -8.41 27.0 544.72 Stream channel edge 28.00 -8.55 28.0 544.58 Stream channel edge 31.00 -6.89 31.0 546.24 33.50 547.30 31.00 -5.83 33.5 547.30 Edge of path 37.50 -5.15 37.5 547.98 43.50			57.0	-5.71	252	57.0	567.11		
Cross Section C STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08 23.00 -6.26 23.0 546.87 25.00 -7.3 25.0 545.83 27.00 -8.41 27.0 544.72 Stream channel edge 28.00 -8.55 28.0 544.58 Stream channel edge 31.00 -6.89 31.0 546.24 Stream channel edge 31.00 -6.89 31.0 546.24 Stream channel edge 31.00 -5.83 33.5 547.30 Edge of path 37.50 -5.15 37.5 547.98 Edge of path			59.0	-5.51	253	59.0	567.31		Fence line
HI2 STN. ROD ANGLE Station Elevation 3.21 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08 23.00 -6.26 23.0 546.87 25.00 -7.3 25.0 545.83 27.00 -8.41 27.0 544.72 28.00 -8.55 28.0 544.58 31.00 -6.89 31.0 546.24 33.50 -5.83 33.5 547.30 Edge of path 37.50 -5.15 37.5 547.98 43.50	Cross	Section C							
3.21 553.63 0.00 -1.49 0.0 551.64 13.00 -3.05 13.0 550.08 23.00 -6.26 23.0 546.87 25.00 -7.3 25.0 545.83 27.00 -8.41 27.0 544.72 Stream channel edge 28.00 -8.55 28.0 544.58 Stream channel edge 31.00 -6.89 31.0 546.24 33.50 -5.83 33.50 -5.83 33.5 547.30 Edge of path 37.50 -5.15 37.5 547.98 43.50	HI2		stn.	ROD	ANGLE	Station	Elevation		
13.00 -3.05 13.0 550.08 23.00 -6.26 23.0 546.87 25.00 -7.3 25.0 545.83 27.00 -8.41 27.0 544.72 Stream channel edge 28.00 -8.55 28.0 544.58 Stream channel edge 31.00 -6.89 31.0 546.24	3.21	553.63	0.00	-1.49		0.0	551.64		
23.00 -6.26 23.0 546.87 25.00 -7.3 25.0 545.83 27.00 -8.41 27.0 544.72 Stream channel edge 28.00 -8.55 28.0 544.58 Stream channel edge 31.00 -6.89 31.0 546.24 33.50 -5.83 33.5 547.30 Edge of path 37.50 -5.15 37.5 547.98 550.36			13.00	-3.05		13.0	550.08		
25.00-7.325.0545.8327.00-8.4127.0544.72Stream channel edge28.00-8.5528.0544.58Stream channel edge31.00-6.8931.0546.2433.50-5.8333.5547.30Edge of path37.50-5.1537.5547.9843.50-2.7743.5550.36			23.00	-6.26		23.0	546.87		
27.00-8.4127.0544.72Stream channel edge28.00-8.5528.0544.58Stream channel edge31.00-6.8931.0546.2433.50-5.8333.5547.30Edge of path37.50-5.1537.5547.9843.50-2.7743.5550.36			25.00	-7.3		25.0	545.83		
28.00 -8.55 28.0 544.58 Stream channel edge 31.00 -6.89 31.0 546.24 33.50 -5.83 33.5 547.30 Edge of path 37.50 -5.15 37.5 547.98 43.50 -2.77 43.5 550.36			27.00	-8.41		27.0	544.72		Stream channel edge
31.00 -6.89 31.0 546.24 33.50 -5.83 33.5 547.30 Edge of path 37.50 -5.15 37.5 547.98 43.50 -2.77 43.5 550.36			28.00	-8.55		28.0	544.58		Stream channel edge
33.50-5.8333.5547.30Edge of path37.50-5.1537.5547.9843.50-2.7743.5550.36			31.00	-6.89		31.0	546.24		01
37.50 -5.15 37.5 547.98 43.50 -2.77 43.5 550.36			33.50	-5.83		33.5	547.30		Edge of path
43.50 -2.77 43.5 550.36			37.50	-5.15		37.5	547.98		<u> </u>
			43.50	-2.77		43.5	550.36		

		56.00	-2.19		56.0	550.94	
		69.50	-1.29		69.5	551.84	Fence line
Cross Sec	ction D						
HI3		STN.	ROD	ANGLE	Station	Elevation	Notes
3.33	544.83	0.00	-2.12	211.00	0.0	542.71	
		13.50	-2.87	181.5	13.5	541.96	
		17.00	-3.62	174	17.0	541.21	
		23.00	-7.79	159	23.0	537.04	
		28.00	-11.61	148	28.0	533.22	
		30.00	-11.56	144	30.0	533.27	Stream channel bottom
		35.00	-8.95	137	35.0	535.88	
		38.00	-6.27	133	38.0	538.56	Base of Redwood
		42.50	-4.83	128	42.5	540	
		51.00	-4.13	121	51.0	540.7	Middle of path, 3' wide/4.5' on diagonal
		55.00	-3.39	118	55.0	541.44	
		79.00	-1.51	108	79.0	543.32	Fence line
Cross See	ction E						
HI3		STN.	ROD	ANGLE	Station	Elevation	Notes
3.33	544.83	0.00	-0.39	0	0.0	543.44	
		7.00	-1.8	340	7.0	542.03	
		14.00	-4.91	314	14.0	538.92	
		26.50	-13.42	279	26.5	530.41	Actively eroding
		28.00	-13.63	276	28.0	530.2	
		29.00	-13.47	274	29.0	530.36	
		39.00	-7.84	262	39.0	535.99	
		55.00	-4.23	253	55.0	539.6	
		63.50	-3	250	63.5	540.83	Edge of stair
		68.00	-3.4	249	68.0	540.43	Bottom of Step
		69.00	-1.96	247	69.0	541.87	
		76.00	-2.86	248	76.0	540.97	On the stair
Cross See	ction F						
HI4		STN.	ROD	ANGLE	Station	Elevation	Notes
4.10	543.83	0.00	-6.5	0.00	0.0	537.33	Along path
		9.00	-6.98	18	9.0	536.85	Along path
		20.00	-10.26	67.5	20.0	533.57	Along path
		34.00	-14.3	102	34.0	529.53	
		35.00	-14.56	103	35.0	529.27	Stream channel, first wet area (below fault)
		36.00	14.84	106		558.67	Top of incision
		36.00	-15.45	106	36.0	528.38	Bottom of incision
		38.00	-15.42	107	38.0	528.41	Bottom of incision
		38.50	-14.7	109	38.5	529.13	Top of incision

4950 -1224 118 495 531.59 Next to steps down (L) 5050 -12.14 119 505 531.67 - 5450 -11.65 1205 540 531.77 - 6600 -11.82 124 660 532.01 vegetation. 7000 -11.84 124 700 531.79 - 7000 -12.25 125 740 531.79 - 7800 -12.25 125 740 531.79 - 7800 -12.23 125 760 531.58 - 6000 -11.81 125 800 532.42 - 92.00 -11.19 126.9 92.0 532.64 - 92.00 -11.41 126.5 88.0 532.42 - 92.00 -11.41 126.5 88.0 532.42 - 92.00 -11.41 126.5 88.0 533.7 Fence line Cross Section G <th></th> <th></th> <th>41.50</th> <th>-13.95</th> <th>112</th> <th>41.5</th> <th>529.88</th> <th></th>			41.50	-13.95	112	41.5	529.88	
Subsection C Subsection C Statu Subsection C Subsection C Cross Section G STN, ROD ANGLE Statu Statu Red cestrum from here to fence. Har visibly detect grade change due to de visibly detect grade chan			49.50	-12.24	118	49.5	531.59	Next to steps down (L)
S400 -1206 120.5 54.0 531.77 S450 -11.65 120.5 54.5 522.18 Red cestrum from here to fence. Har visity detect grade chango due to der vegetation. 7000 -11.82 124 66.00 531.99 74.00 -1206 125 74.0 531.77 76.00 -12.23 125 76.0 531.58 78.00 -11.8 125 80.0 532.03 80.00 -11.8 125 80.0 532.03 90.00 -11.8 126 80.0 532.03 90.00 -11.41 126.5 88.0 532.42 90.00 -11.41 126.9 92.0 532.64 90.00 -10.4 127 96.0 533.027 26.3 529.13 STN ROD ANGLE Station Florea 26.3 529.13 STN ROD ANGLE Station Florea 26.3 529.13 STN ROD ANGLE			50.50	-12.14	119	50.5	531.69	
54.50 -11.65 120.5 54.5 532.18 Red centrum from here to fence. Har visibly detect grade change due to de vegetation. 70.00 -11.82 124 66.0 532.01 vegetation. 70.00 -11.84 124 70.0 531.79 Appears to be bottom of dominant. channel in this area. 78.00 -12.25 72.5 76.0 531.58 (2) New Zealand Lacebacks (Hoheria populnea) ~10yrs. Drp line of trunk s 80.00 -11.8 126 80.0 532.45 (2) New Zealand Lacebacks (Hoheria populnea) ~10yrs. Drp line of trunk s 80.00 -11.41 126.5 88.0 532.42 populnea) ~10yrs. Drp line of trunk s 2.63 529.13 STN. ROD ANGLE Station Revertion 2.63 529.13 STN. ROD ANGLE Station Notes 2.63 529.13 STN. ROD ANGLE Station Notes 2.63 529.13 STN. ROD ANGLE Station Notes 2.63 529.13 STN			54.00	-12.06	120.5	54.0	531.77	
Red cstrum from here to fence. Har visibly detect grade change due to der visibly detect grade due to der visibly detet grade due to der visibl			54.50	-11.65	120.5	54.5	532.18	
Géo0 -1182 124 660 532.01 vesain Jester Galge Gale Galge Gale Galge 7000 -11.84 124 70.0 531.99								Red cestrum from here to fence. Hard to
7000 -11.84 124 700 531.99 74.00 -12.06 125 74.0 531.77 Appears to be bottom of dominant channel in this area. 76.00 -12.23 125 76.0 531.58 (2) New Zealand Lacebacks (Hoheria populnea) ~10yrs. Drip line of trunk s 80.00 -11.8 125 80.0 532.03 populnea) ~10yrs. Drip line of trunk s 84.00 -11.38 126 84.0 533.45 (2) New Zealand Lacebacks (Hoheria populnea) ~10yrs. Drip line of trunk s 86.00 -11.41 126.9 92.0 532.64 (2) New Zealand Lacebacks (Hoheria populnea) ~10yrs. Drip line of trunk s 2.63 529.13 STN ROD ANGLE Station Elevation Notes 4850<			66.00	-11.82	124	66.0	532.01	vegetation.
74.00 -12.06 125 74.0 531.77 Appears to be bottom of dominant channel in this area. 76.00 -12.23 125 78.0 531.58 (2) New Zealand Lacebacks (Hoheria populnea) ~10yrs. Drip line of trunk at the second populnea) ~10yrs. Drip line of trunk at this area. 263 529/13 STN. RCD ANGLE Station Elevation Notes Cross Section H 1141 60 420			70.00	-11.84	124	70.0	531.99	5
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			74.00	-12.06	125	74.0	531.77	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $								Appears to be bottom of dominant
78.00 -12.23 125 78.0 531.6 (2) New Zealand Lacebacks (Hoheria populnea) ~10yrs. Drip line of trunk a 80.00 -11.8 125 80.0 532.03 populnea) ~10yrs. Drip line of trunk a 80.00 -11.11 126.5 88.0 532.42 populnea) ~10yrs. Drip line of trunk a 90.00 -10.4 127 96.0 533.43 Fence line Cross Section G			76.00	-12.25	125	76.0	531.58	channel in this area.
Cross Section I STN. ROD ANGLE Station Elevation Notes 24.00 -11.41 126.5 88.0 532.45 populnea) ~10yrs. Drip line of trunk a 2000 -11.11 126.5 88.0 532.42 populnea) ~10yrs. Drip line of trunk a Cross Section G -11.11 126.9 92.0 533.43 Fence line 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 3.300 -5.85 33.5 522.92 Just of path In bankfull area/divia escarpment 4.50.0 -11.04 85 <td></td> <td></td> <td>78.00</td> <td>-12.23</td> <td>125</td> <td>78.0</td> <td>531.6</td> <td></td>			78.00	-12.23	125	78.0	531.6	
80.00 -11.8 125 80.0 532.03 populnea) ~10yrs. Drip line of trunk s 84.00 -11.13 126 84.0 532.45 92.00 -11.19 126.9 92.0 532.64 96.00 -10.4 127 96.0 533.43 Fence line Cross Section G HI5 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 3.00 -2.74 0 13.0 526.39 Still on path 33.50 -6.21 55.5 33.5 522.92 Just off path 3.30 -5.86 74 42.0 520.57 In bankfull area/clivia escarpment 48.50 -11.04 85 48.5 518.09 Top of bank -> small incision 49.50 -11.41 86 49.5 517.72 Stream bed 52.50 -11.58 89.5 52.5 517.55 104 of apparent stream bed. 60.00 -8.48 96								(2) New Zealand Lacebacks (Hoheria
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			80.00	-11.8	125	80.0	532.03	populnea) ~10yrs. Drip line of trunk at 80.5
88.00 -11.41 126.5 88.00 532.42 92.00 -11.19 126.9 92.0 532.64 96.00 -10.4 127 96.0 533.43 Fence line Cross Section G HIS 529.13 STN. ROD ANGLE Station Elevation Notes 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 3.00 -5.75 2.8 2.40 523.39 Stedge of path 33.00 3.300 -5.86 55 3.30 523.27 Still on path 3.350 -6.21 55.5 3.35 522.92 Jusat off path 42.00 -8.56 74 42.0 520.57 In bankfull area/clivia escarpment 48.50 -11.04 85 517.72 Stream bed 52.55 52.50 -11.58 89.5 52.55			84.00	-11.38	126	84.0	532.45	
92.00 -11.19 126.9 92.0 532.64 96.00 -10.4 127 96.0 533.43 Fence line Cross Section G HIS 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 2.640 -5.95 2.8 2.40 523.18 S. edge of path 33.00 -5.86 55.5 33.5 522.92 Just off path 42.00 -8.56 74 42.0 52.05 In bankfull area/clivia escarpment 48.50 -11.04 85 48.5 518.09 Top of bank -> small incision 49.50 -11.41 86 49.5 517.75 <			88.00	-11.41	126.5	88.0	532.42	
96.00 -10.4 127 96.0 533.43 Fence line Cross Section G HI5			92.00	-11.19	126.9	92.0	532.64	
Cross Section G HIS 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 1300 2.74 0 13.0 526.39 Station Sedge of path 2.63 529.13 STN. 6.27 0 13.0 526.39 2.400 5.95 2.8 2.40 52.318 S. edge of path 3.300 5.86 5.5 3.3.0 523.27 Still on path 3.300 6.21 5.5.5 3.3.5 522.92 Jusat off path 4.200 8.56 .74 42.0 520.57 In bankfull area/divia escarpment 4.850 -11.04 85 48.5 518.09 Top of bank3 small incision 4.950 -11.14 85 517.75 End of apparent stream bed. 5.250 -11.58 89.5 52.5 517.75 End of apparent stream bed. 5.450 -0.04 71.5 52.63 Redwood between 59.5-60.5 Station 6.000 -8.48 96 6.00 52.65 Redwood between 59.5-60.5			96.00	-10.4	127	96.0	533.43	Fence line
HI5 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 1.000 1.14 0.0 530.27 0 530.27 0 13.00 526.39 1.1300 -2.74 0.0 13.00 526.39 51.00 path 51.00 52.00 71.00 52.60 71.00 52.60 71.00 52.60 71.00 52.60 71.00 52.60 71.00 52.60 71.00 52.60 71.00 52.60 71.00 52.60 71.00	Cross Se	ection G						
2.63 529.13 STN. ROD ANGLE Station Elevation Notes 0.00 1.14 0.0 530.27 1300 -2.74 0 130 526.39 2400 -5.95 28 24.0 523.18 S. edge of path 33.00 -5.86 55 33.0 523.27 Still on path 33.00 -5.86 74 42.0 520.57 In bankfull area/clivia escarpment 48.50 -11.04 85 48.5 518.09 Top of bank -> small incision 49.50 -11.41 86 49.5 517.72 Stream bed 52.50 -11.58 89.5 52.5 517.75 End of apparent stream bed. 54.50 -10.94 92 54.5 518.19 Just out of channel 60.00 -8.48 96 60.0 520.65 Redwood between 59.5-60.5 71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03 S. edge of path 76.50 -4.1 105.5<	HI5							
0.00 1.14 0.0 530.27 13.00 -2.74 0 13.0 526.39 24.00 -5.95 28 24.0 523.18 S. edge of path 33.00 -5.86 55 33.0 523.27 Still on path 33.00 -6.21 55.5 33.5 522.92 Jusat off path 42.00 -8.56 74 42.0 520.57 In bankfull area/clivia escarpment 48.50 -11.04 85 48.5 518.09 Top of bank -> small incision 49.50 -11.41 86 49.5 517.72 Stream bed 52.50 -11.58 89.5 52.5 517.55 End of apparent stream bed. 54.50 -10.49 92 54.5 518.09 Just out of channel 60.00 -8.48 90 60.0 520.65 Redwood between 59.5-60.5 71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03 Sedge of path Cross Section H HI	2.63	529.13	stn.	ROD	ANGLE	Station	Elevation	Notes
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			0.00	1.14		0.0	530.27	
24.00 -5.95 28 24.0 523.18 S. edge of path 33.00 -5.86 55 33.0 523.27 Still on path 33.50 -6.21 55.5 33.5 522.92 Jusat off path 42.00 -8.56 74 42.0 520.57 In bankfull area/clivia escarpment 48.50 -11.04 85 48.5 518.09 Top of bank -> small incision 49.50 -11.41 86 49.5 517.72 Stream bed 52.50 -11.58 89.5 52.5 517.55 End of apparent stream bed. 54.50 -10.94 92 54.5 518.19 Just out of channel 60.00 -8.48 96 60.0 520.65 Redwood between 59.5-60.5 71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03 Stedge of path 76.50 -2.63 108 83.0 526.5 Fence line Cross Section H HI5 2.63 529.13 STN.			13.00	-2.74	0	13.0	526.39	
33.00 -5.86 55 33.0 523.27 Still on path 33.50 -6.21 55.5 33.5 522.92 Jusat off path 42.00 -8.56 74 42.0 520.57 In bankfull area/clivia escarpment 48.50 -11.04 85 48.5 518.09 Top of bank -> small incision 49.50 -11.41 86 49.5 517.72 Stream bed 52.50 -11.58 89.5 52.5 517.55 End of apparent stream bed. 54.50 -10.94 92 54.5 518.19 Just out of channel 60.00 -8.48 96 60.0 520.65 Redwood between 59.5-60.5 71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03 Section H HI5 83.00 -2.63 108 83.0 526.58 Fence line 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 2.63 529.13 STN. ROD AN			24.00	-5.95	28	24.0	523.18	S. edge of path
33.50 -6.21 55.5 33.5 522.92 Jusat off path 42.00 -8.56 74 42.0 520.57 In bankfull area/clivia escarpment 48.50 -11.04 85 48.5 518.09 Top of bank -> small incision 49.50 -11.41 86 49.5 517.72 Stream bed 52.50 -11.58 89.5 52.5 517.55 End of apparent stream bed. 54.50 -10.94 92 54.5 518.19 Just out of channel 60.00 -8.48 96 60.0 520.65 Redwood between 59.5-60.5 71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03 Steady 83.00 -2.55 108 83.0 526.5 Fence line Cross Section H HI5 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 2.63 529.13 STN. ROD ANGLE 52.0 523 2.0 523 </td <td></td> <td></td> <td>33.00</td> <td>-5.86</td> <td>55</td> <td>33.0</td> <td>523.27</td> <td>Still on path</td>			33.00	-5.86	55	33.0	523.27	Still on path
42.00 -8.56 74 42.0 520.57 In bankfull area/clivia escarpment 48.50 -11.04 85 48.5 518.09 Top of bank -> small incision 49.50 -11.41 86 49.5 517.72 Stream bed 52.50 -11.58 89.5 52.5 517.55 End of apparent stream bed. 54.50 -10.94 92 54.5 518.19 Just out of channel 60.00 -8.48 96 60.0 520.65 Redwood between 59.5-60.5 71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03 S. edge of path 76.50 -2.63 108 83.0 526.58 S. edge of path 76.50 -2.63 108 85.0 526.5 Fence line Cross Section H HI5 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 0.00 -5.64 15 0.0 523.49 2.00 520.3 522.31 Ins			33.50	-6.21	55.5	33.5	522.92	Jusat off path
48.50 -11.04 85 48.5 518.09 Top of bank -> small incision 49.50 -11.41 86 49.5 517.72 Stream bed 52.50 -11.58 89.5 52.5 517.55 End of apparent stream bed. 54.50 -10.94 92 54.5 518.19 Just out of channel 60.00 -8.48 96 60.0 520.65 Redwood between 59.5-60.5 71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03 83.00 -2.55 83.00 -2.63 108 83.0 526.58 Fence line Cross Section H HI5 - - - Notes 0.00 -5.64 15 0.0 523.49 Notes 0.00 -5.64 15 0.0 523.49 Notes 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 2.63 529.13 -6.62 18.25 2.5 522.			42.00	-8.56	74	42.0	520.57	In bankfull area/clivia escarpment
49.50 -11.41 86 49.5 517.72 Stream bed 52.50 -11.58 89.5 52.5 517.55 End of apparent stream bed. 54.50 -10.94 92 54.5 518.19 Just out of channel 60.00 -8.48 96 60.0 520.65 Redwood between 59.5-60.5 71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03 83.00 -2.55 108 83.0 526.58 Fence line Cross Section H - - - - - - - 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 2.63 529.13 STN. ROD ANGLE 52.3 52.31 Inside south of path			48.50	-11.04	85	48.5	518.09	Top of bank -> small incision
52.50 -11.58 89.5 52.5 517.55 End of apparent stream bed. 54.50 -10.94 92 54.5 518.19 Just out of channel 60.00 -8.48 96 60.0 520.65 Redwood between 59.5-60.5 71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03 83.00 -2.55 108 83.0 526.58 85.00 -2.63 108 85.0 526.5 Fence line Cross Section H HI5 - - - - 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 2.63 529.13 STN. ROD ANGLE 520.0 523.49 10.0 523.49 2.00 -6.13 17.5 2.0 523 10.0 522.31 Inside south of path			49.50	-11.41	86	49.5	517.72	Stream bed
54.50 -10.94 92 54.5 518.19 Just out of channel 60.00 -8.48 96 60.0 520.65 Redwood between 59.5-60.5 71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03			52.50	-11.58	89.5	52.5	517.55	End of apparent stream bed.
60.00 -8.48 96 60.0 520.65 Redwood between 59.5-60.5 71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03			54.50	-10.94	92	54.5	518.19	Just out of channel
71.50 -4.5 104 71.5 524.63 S. edge of path 76.50 -4.1 105.5 76.5 525.03 83.00 -2.55 108 83.0 526.58 85.00 -2.63 108 85.0 526.5 Fence line Cross Section H H15			60.00	-8.48	96	60.0	520.65	Redwood between 59.5-60.5
76.50 -4.1 105.5 76.5 525.03 83.00 -2.55 108 83.0 526.58 85.00 -2.63 108 85.0 526.5 Fence line Cross Section H H15 - - - 2.63 529.13 STN. ROD ANGLE Station Elevation 0.00 -5.64 15 0.0 523.49 - - 2.00 -6.13 17.5 2.0 523 - 2.50 -6.82 18.25 2.5 522.31 Inside south of path			71.50	-4.5	104	71.5	524.63	S. edge of path
83.00 -2.55 108 83.0 526.58 85.00 -2.63 108 85.00 526.5 Fence line Cross Section H H15 - - - - - 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 0.00 -5.64 15 0.0 523.49 - - - 2.00 -6.13 17.5 2.0 523 - Inside south of path			76.50	-4.1	105.5	76.5	525.03	
85.00 -2.63 108 85.0 526.5 Fence line Cross Section H			83.00	-2.55	108	83.0	526.58	
Cross Section H H15 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 0.00 -5.64 15 0.0 523.49 2.00 -6.13 17.5 2.0 523 2.50 -6.82 18.25 2.5 522.31 Inside south of path			85.00	-2.63	108	85.0	526.5	Fence line
HI5 2.63 529.13 STN. ROD ANGLE Station Elevation Notes 0.00 -5.64 15 0.0 523.49 2.00 -6.13 17.5 2.0 523 Inside south of path	Cross Se	ection H						
2.63 529.13 STN. ROD ANGLE Station Elevation Notes 0.00 -5.64 15 0.0 523.49 <	HI5							
0.00-5.64150.0523.492.00-6.1317.52.05232.50-6.8218.252.5522.31Inside south of path	2.63	529.13	stn.	ROD	ANGLE	Station	Elevation	Notes
2.00-6.1317.52.05232.50-6.8218.252.5522.31Inside south of path			0.00	-5.64	15	0.0	523.49	
2.50 -6.82 18.25 2.5 522.31 Inside south of path			2.00	-6.13	17.5	2.0	523	
			2.50	-6.82	18.25	2.5	522.31	Inside south of path

8.00	-6.81	27	8.0	522.32	Other side of path
20.00	-9.23	44.5	20.0	519.9	
24.00	-10.76	51	24.0	518.37	
26.50	-12.73	54	26.5	516.4	Actively eroding at edge of pool
					Pool depth varies slightly, between 1-2".
39.00	-12.76	67	39.0	516.37	Fine muck
40.00	-12.1	68.5	40.0	517.03	
					Redwood's lowside center 1.5" to the west.
45.50	-10.82	73	45.5	518.31	45'-48.5'
50.00	-9.26	77	50.0	519.87	High side
53.00	-8.81	79	53.0	520.32	Log 50.5-53' at edge of path.
59.00	-6.03	84.5	59.0	523.1	Edge of path
68.50	-5.2	87	68.5	523.93	
72.00	-5.23	89	72.0	523.9	Top of log
72.70	-6	89	72.7	523.13	Undercut back to 72.5
74.00	-5.87	89.5	74.0	523.26	
		Water	26.2	516.6	
			39.3	516.6	

Cross Se	ction I						
HI5							
2.63	529.13	stn.	ROD	ANGLE	Station	Elevation	Notes
		0.00	-10.6	28	0.0	518.53	Edge of path
		2.00	44.00	20	2.0	F 4 7 0 4	

0.00	10.0	20	0.0	510.55	Luge of paul
2.00	-11.32	29	2.0	517.81	Edge of planting bed
2.80	-12.47	29	2.8	516.66	S. edge of path
6.00	-12.43	31.5	6.0	516.7	
10.00	-10.91	33	10.0	518.22	
20.00	-13.06	39.5	20.0	516.07	Depression
22.00	-12.89	40.5	22.0	516.24	Top of bank
22.50	-13.41	40	22.5	515.72	
23.50	-13.38	41	23.5	515.75	
24.00	-13.01	42	24.0	516.12	
25.70	-13	43	25.7	516.13	Edge of channel
27.00	-12.44	44	27.0	516.69	Bed area
37.00	-11.49	50	37.0	517.64	Edge of path
40.00	-11.77	52	40.0	517.36	
45.00	-10.32	55	45.0	518.81	
56.50	-8.88	62	56.5	520.25	Edge of path
59.00	-8.84	63	59.0	520.29	Edge of path
67.50	-7.42	68	67.5	521.71	
72.50	-7.32		72.5	521.81	Depression
76.00	-6.62		76.0	522.51	
78.00	-6.87	73	78.0	522.26	
81.00	-6.74	75	81.0	522.39	

	Cross	Section	
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HI6

3.75	524.14	stn.	ROD	ANGLE	Station	Elevation		Notes
		0.00	-6.82	0	0.0	517.32		
		5.00	-8.28	2	5.0	515.86		End of bed
		5.50	-9.03	2.5	5.5	515.11		Edge of path
		8.50	-9.09	5	8.5	515.05		
		17.00	-9.32	7	17.0	514.82		
		17.50	-9.82	7.5	17.5	514.32		Rock edge, likely submerged when flooded.
		19.00	-9.91	8	19.0	514.23		Edge of pool
		19.50	-10.89	8	19.5	513.25		Water depth .8 ft.
		22.00	-11.59		22.0	512.55		Center
		26.00	-9.59		26.0	514.55		
		27.00	-9.19		27.0	514.95		
		28.00	-9		28.0	515.14		
		31.00	-9.19	15	31.0	514.95		Edge of path
		34.00	-9.21	17	34.0	514.93		
		42.00	-8.89	23	42.0	515.25		
		50.00	-6.82	32	50.0	517.32		
		58.00	-6.93	42	58.0	517.21		Edge of path
		62.00	-7.52	47	62.0	516.62		Other edge of path
								Redwood diam from 67-70, center at
		73.00	-7.73	65.5	73.0	516.41		68.5,1.25' from tape west to redwood
		80.00	-7.64	77	80.0	516.5		
		90.00	-8.83	92	90.0	515.31		
		94.00	-9.32	96.5	94.0	514.82		Fence line
Cross Se	ction K							
HI6								
3.75	524.14	stn.	ROD	DTT	ANGLE	Station	Elevation	Notes
		0.00	-10.21		18	0.0	513.93	
		1.50		-0.9		1.5	513.54	
		4.00		-1.2		4.0	513.24	
		5.00		-1		5.0	513.44	
		8.00		-0.9		8.0	513.54	
		13.00	-10.73		25	13.0	513.41	Top of bank
		13.60	-11.6		25	13.6	512.54	In the channel, armored flagstone
		14.30	-11.9		25	14.3	512.24	Other side of channel
		15.00	-10.89		25.25	15.0	513.25	Top of bank
		19.00		-0.7		19.0	513.74	
		24.00	-11.2	-1.2	32.00	24.0	512.94	Edge of path
		27.00	-11.22		34	27.0	512.92	
		52.00	-12.9		54	52.0	511.24	Honeysuckle bed east of path
		60.50	-11.95		63	60.5	512.19	Tree east of tape from 57-60.6

		64.00 78.00 88.00	-12.24	-2.24 -1.8 -2.75	66.00	64.0 78.0 88.0	512.2 512.64 511.69	
Cross Sec	tion	90.00		-3		90.0	511.44	Fence line
I ribuary I								
2 75	57/1/	CTNI				Station	Flovation	Notoc
3.73	524.14	311N. 0.00			ANGLE	Station		NOLES
		13.50	-2.21		273.00	13.5	520.28	
		15.50	-5.00		201.00	15.5	51966	Edge of channel
		15.00	- 1. 10		285.00	15.0	518.88	incision
		15.00	-9.20		205.00	15.0	510.00	top of rock in channel center Large rock
		16.50	-4.78		285.00	16.5	519.36	attempt to secure channel?
		16.80	-5.5		285.00	16.8	518.64	Back down into incision
		17.00	-4.55	-2	285.00	17.0	519.59	Undercut ~1"
		22.00		-1		22.0	520.59	
		25.50	-3.44		293.00	25.5	520.7	
Cross Sec Tribuary2	tion							
3 75	52414	STN	ROD	DTT	ANGI F	Station	Flevation	Notes
5.75	521.11	0.00	ROD	-22	/ II VOLL	00	51978	On a redwood root ball
		2.50		-27		2.5	519.28	Redwood log/berm
		5.00	-4.96	-2.8	284.00	5.0	519.18	other side of redwood log/berm
		9.00	-4.72	2.0	281	9.0	519.42	Edge of path
		11.90	-3.85		279	11.9	520.29	Dropping off a root
		12.00	2 5 2		270 E	12.0	E 20 (1	On a root(root runs perp to cross
		12.00	-3.33		278.5	12.0	520.61	section)
		10.00	-1.70		272	10.0	522.30	l la an log/barm
		23.20	208		200	23.Z	522.75	Still in channel
		23.30	-2.00		200	23.5	521.00	Living root in bottom of channel
		2 1.00	-2.15		207	21.0	522.05	in the channel
		2 1.20	-2.07		207	21.2	522.05	hank of channel
		28.00	-1.69		262.5	28.0	522.45	
Cross Sec Tribuary3 HI6	tion							
3.75	524.14	stn.	ROD	DTT	ANGLE	Station	Elevation	Notes
		0.00	-1.69		262.50	0.0	522.45	
		7.00	-1.89		261.50	7.0	522.25	
		8.50	-2.23		261.00	8.5	521.91	Foundation of fence port. Broken, not flat concrete.

9.00	-2.49	261.00	9.0	521.65	Off of the concrete, into the water Channel filled with softball sized rock placed by someone. Site rock not from
11.00	-2.57	260.50	11.0	521.57	stream
13.00	-2.56	260.25	13.0	521.58	Edge of channel
15.00	-2.01	259.50	15.0	522.13	Top of bank
17.00	-2	259.00	17.0	522.14	
18.00	-2.29	258.50	18.0	521.85	
19.00	-2.48	258.00	19.0	521.66	
26.00	-2.45	254.00	26.0	521.69	
33.00	-2.49	246.00	33.0	521.65	
49.00	-4.73	162.00	49.0	519.41	

Appendix D

Redwood Canyon Reach								
	Run Off (cu. ft/sec)	Coefficient	Intensity (in/hr)	Area (acres)				
5yr Occurrence	1.272	0.6	0.8	2.65				
10yr Occurrence	1.431	0.6	0.9	2.65				
25yr Occurrence	1.7808	0.6	1.12	2.65				
50yr Occurrence	2.0511	0.6	1.29	2.65				
100yr Occurrence	2.226	0.6	1.4	2.65				
South Reach								
	Run Off (cu. ft/sec)	Coefficient	Intensity (in/hr)	Area (acres)				
5yr Occurrence	22.44	0.6	0.8	46.75				
10yr Occurrence	25.245	0.6	0.9	46.75				
25yr Occurrence	31.416	0.6	1.12	46.75				
50yr Occurrence	36.1845	0.6	1.29	46.75				
100yr Occurrence	39.27	0.6	1.4	46.75				

Based on Contra Costa County Mean Seasonal Isohyet Map and Precipitation-Frequency-Depth Curves

Appendix E



Figure E1 Area above driveway to Carmelite Monastery and site of spring that feeds the Redwood Canyon Reach of the Cerrito Creek.



Figure E2 Area of Cross Section A.



Figure E3 Area of Cross Section B.



Figure E4 View Upstream of area with Cross Sections C & D.



Figure A5 View looking downstream from Cross Section E. There is increased vegetation starting where water emerges for the first time in the stream bed.



Figure EA6 Incomplete view of Cross Section F.



FigureE5 First emergence of water in the main stream channel, just below Cross Section E.



Figure E8 Cross View north across the first pool at Cross Section H.



Figure E9 Tributary streams coming from neighboring properties. To the right, a stump of a Coast Redwood that was removed in 2007 from water damaged roots.



Figure E10 Looking upstream to Cross Section Tributary 1.