APPENDIX A

AIR QUALITY MODELING DATA

Big Tujunga Reservoir Sediment Removal 2013 - 052912

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
User Defined Industrial	1	User Defined Unit
User Defined Industrial	1	User Defined Unit

1.2 Other Project Characteristics

Urbanization Rural

Climate Zone 9

Wind Speed (m/s) 2.2

Precipitation Freq (Days) 33

Utility Company Southern California Edison

1.3 User Entered Comments

Project Characteristics - Not sure if utility is LADWP or Edison, LADWP is more conservative.

Land Use - Big Tujunga Reservoir area = 68 acres.
Maple Canyon SPS area = 22 acres.

Construction Phase - Site and road prep 4/1-12/2013 6d/wk 11 days
Dry season work 4/14-15-15--10/11-11-12/2013 6d/wk 25 wk 155 days
Storm season transport 10/14/2013-4/4/2014 5d/wk 25 wk 125 days

Off-road Equipment - Big T Res - 4 excavators, 4 loaders

Off-road Equipment - SPS-1 excavator, 1 dozer, 4 loaders

Off-road Equipment - OFFROAD 2011 load factors
Road and site prep-1dozer, 4 loader/backhoe, 1 grader

Off-road Equipment - Crusher site- 2 20 hp generators, 2 hrs/day

Off-road Equipment - 4 front loaders, 1 dozer, 1 excavator, per info provided.

Off-road Equipment - Storm season xport - 1 loader

Trips and VMT - Worker trips-default 4 site, SPS, BTR
Est 10 for crush, 5 for storm season

On-road Fugitive Dust -

Grading - On-road hauling not calculated with CalEEMod

Construction Off-road Equipment Mitigation - 3x water, but sediment is wet; negligible dust
Off-road engine mit - all Tier 3

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2013	8.43	59.24	45.71	0.08	12.28	3.69	15.97	3.35	3.69	7.03			0.00	0.77	0.00	7,532.74
2014	0.38	2.32	2.37	0.00	0.11	0.18	0.29	0.00	0.18	0.19			0.00	0.04	0.00	365.89
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2013	5.46	32.36	45.21	0.08	5.37	2.74	8.11	1.33	2.74	4.07			0.00	0.77	0.00	7,532.74
2014	0.28	1.51	2.29	0.00	0.11	0.15	0.26	0.00	0.15	0.15			0.00	0.04	0.00	365.89
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

3.2 Road and site preparation - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.02	0.00	6.02	3.31	0.00	3.31						0.00
Off-Road	4.01	30.60	19.22	0.03		1.77	1.77		1.77	1.77				0.36		3,218.20
Total	**4.01**	**30.60**	**19.22**	**0.03**	**6.02**	**1.77**	**7.79**	**3.31**	**1.77**	**5.08**				**0.36**		**3,218.20**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.13	0.13	1.57	0.00	0.32	0.01	0.33	0.01	0.01	0.02				0.02		266.42
Total	**0.13**	**0.13**	**1.57**	**0.00**	**0.32**	**0.01**	**0.33**	**0.01**	**0.01**	**0.02**				**0.02**		**266.42**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.35	0.00	2.35	1.29	0.00	1.29						0.00
Off-Road	2.46	15.47	18.13	0.03		1.22	1.22		1.22	1.22				0.36		3,218.20
Total	**2.46**	**15.47**	**18.13**	**0.03**	**2.35**	**1.22**	**3.57**	**1.29**	**1.22**	**2.51**				**0.36**		**3,218.20**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.13	0.13	1.57	0.00	0.32	0.01	0.33	0.01	0.01	0.02				0.02		266.42
Total	**0.13**	**0.13**	**1.57**	**0.00**	**0.32**	**0.01**	**0.33**	**0.01**	**0.01**	**0.02**				**0.02**		**266.42**

3.3 Maple SPS - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.67	0.00	8.67	3.31	0.00	3.31						0.00
Off-Road	3.87	29.35	18.83	0.03		1.71	1.71		1.71	1.71				0.35		3,150.25
Total	**3.87**	**29.35**	**18.83**	**0.03**	**8.67**	**1.71**	**10.38**	**3.31**	**1.71**	**5.02**				**0.35**		**3,150.25**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.13	0.13	1.57	0.00	0.32	0.01	0.33	0.01	0.01	0.02				0.02		266.42
Total	**0.13**	**0.13**	**1.57**	**0.00**	**0.32**	**0.01**	**0.33**	**0.01**	**0.01**	**0.02**				**0.02**		**266.42**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.38	0.00	3.38	1.29	0.00	1.29						0.00
Off-Road	2.41	15.16	17.69	0.03		1.20	1.20		1.20	1.20				0.35		3,150.25
Total	**2.41**	**15.16**	**17.69**	**0.03**	**3.38**	**1.20**	**4.58**	**1.29**	**1.20**	**2.49**				**0.35**		**3,150.25**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.13	0.13	1.57	0.00	0.32	0.01	0.33	0.01	0.01	0.02				0.02		266.42
Total	**0.13**	**0.13**	**1.57**	**0.00**	**0.32**	**0.01**	**0.33**	**0.01**	**0.01**	**0.02**				**0.02**		**266.42**

3.4 Big Tujunga Reservoir - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.65	0.00	2.65	0.00	0.00	0.00						0.00
Off-Road	4.06	28.83	21.78	0.04		1.91	1.91		1.91	1.91				0.36		3,508.90
Total	**4.06**	**28.83**	**21.78**	**0.04**	**2.65**	**1.91**	**4.56**	**0.00**	**1.91**	**1.91**				**0.36**		**3,508.90**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.17	0.18	2.10	0.00	0.43	0.01	0.44	0.02	0.01	0.03				0.02		355.23
Total	**0.17**	**0.18**	**2.10**	**0.00**	**0.43**	**0.01**	**0.44**	**0.02**	**0.01**	**0.03**				**0.02**		**355.23**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.03	0.00	1.03	0.00	0.00	0.00						0.00
Off-Road	2.66	16.80	22.80	0.04		1.51	1.51		1.51	1.51				0.36		3,508.90
Total	**2.66**	**16.80**	**22.80**	**0.04**	**1.03**	**1.51**	**2.54**	**0.00**	**1.51**	**1.51**				**0.36**		**3,508.90**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.17	0.18	2.10	0.00	0.43	0.01	0.44	0.02	0.01	0.03				0.02		355.23
Total	**0.17**	**0.18**	**2.10**	**0.00**	**0.43**	**0.01**	**0.44**	**0.02**	**0.01**	**0.03**				**0.02**		**355.23**

3.5 Seasonal stockpile, crush, transport - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.11	0.67	0.38	0.00		0.04	0.04		0.04	0.04				0.01		74.31
Total	**0.11**	**0.67**	**0.38**	**0.00**		**0.04**	**0.04**		**0.04**	**0.04**				**0.01**		**74.31**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.09	0.09	1.05	0.00	0.21	0.01	0.22	0.01	0.01	0.02				0.01		177.62
Total	**0.09**	**0.09**	**1.05**	**0.00**	**0.21**	**0.01**	**0.22**	**0.01**	**0.01**	**0.02**				**0.01**		**177.62**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00				0.01		74.31
Total	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**				**0.01**		**74.31**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.09	0.09	1.05	0.00	0.21	0.01	0.22	0.01	0.01	0.02				0.01		177.62
Total	**0.09**	**0.09**	**1.05**	**0.00**	**0.21**	**0.01**	**0.22**	**0.01**	**0.01**	**0.02**				**0.01**		**177.62**

3.6 Storm season transport to Sunland - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.37	2.45	1.90	0.00		0.21	0.21		0.21	0.21				0.03		278.58
Total	**0.37**	**2.45**	**1.90**	**0.00**		**0.21**	**0.21**		**0.21**	**0.21**				**0.03**		**278.58**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.04	0.04	0.52	0.00	0.11	0.00	0.11	0.00	0.00	0.01				0.01		88.81
Total	**0.04**	**0.04**	**0.52**	**0.00**	**0.11**	**0.00**	**0.11**	**0.00**	**0.00**	**0.01**				**0.01**		**88.81**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.24	1.47	1.81	0.00		0.15	0.15		0.15	0.15				0.03		278.58
Total	**0.24**	**1.47**	**1.81**	**0.00**		**0.15**	**0.15**		**0.15**	**0.15**				**0.03**		**278.58**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.04	0.04	0.52	0.00	0.11	0.00	0.11	0.00	0.00	0.01				0.01		88.81
Total	**0.04**	**0.04**	**0.52**	**0.00**	**0.11**	**0.00**	**0.11**	**0.00**	**0.00**	**0.01**				**0.01**		**88.81**

3.6 Storm season transport to Sunland - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.34	2.28	1.88	0.00		0.18	0.18		0.18	0.18				0.03		278.52
Total	**0.34**	**2.28**	**1.88**	**0.00**		**0.18**	**0.18**		**0.18**	**0.18**				**0.03**		**278.52**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.04	0.04	0.48	0.00	0.11	0.00	0.11	0.00	0.00	0.01				0.00		87.37
Total	**0.04**	**0.04**	**0.48**	**0.00**	**0.11**	**0.00**	**0.11**	**0.00**	**0.00**	**0.01**				**0.00**		**87.37**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.24	1.47	1.81	0.00		0.15	0.15		0.15	0.15				0.03		278.52
Total	**0.24**	**1.47**	**1.81**	**0.00**		**0.15**	**0.15**		**0.15**	**0.15**				**0.03**		**278.52**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00		0.00
Worker	0.04	0.04	0.48	0.00	0.11	0.00	0.11	0.00	0.00	0.01				0.00		87.37
Total	**0.04**	**0.04**	**0.48**	**0.00**	**0.11**	**0.00**	**0.11**	**0.00**	**0.00**	**0.01**				**0.00**		**87.37**

Big Tujunga Reservoir Sediment Removal												
	On-road NOx emissions											
					Nox			Nox			Nox	
					Base/all model year - No mit			**2007 model year**			**2010 model year**	
	res-SPS											
	400	RT daily			running			running			running	
	800	1-way			Running emission factor from EMFAC 2011 summer 2013 all model year 20 mph			Running emission factor from EMFAC 2011 summer 2013 - 2007model year 20 mph			Running emission factor from EMFAC 2011 summer 2013 - 2010 model year 20 mph	
	2.2	miles res to SPS			11.43255	gr/VMT		9.930938	gr/VMT		2.872786	gr/VMT
	2.8	miles SPS to res			50.4	#/day		43.7	#/day		12.7	#/day
	5	miles/RT										
	2000	VMT/day			idle			idle			idle	
	3	min idle at res			idle emission factor from EMFAC 2011 summer 2013			idle emission factor from EMFAC 2011 summer 2013			idle emission factor from EMFAC 2011 summer **2023**	
	3	min idle at SPS			78.926	gr/hr		78.926	gr/hr		40.99567	gr/hr
	6	min idle/RT			7.0	#/day		7.0	#/day		3.6	#/day
	2400	min idle/day										
	40.0	hrs idle/day			total res-SPS			total res-SPS			total res-SPS	
					57.3	**#/day**		**50.7**	**#/day**		**16.3**	**#/day**
	crusher-stockpile											
	28	RT daily			Base - No mit			Base - No mit			Base - No mit	
	56	1-way										
	1.0	miles crsh to pile			running			running			running	
	1.3	miles pile to crush			11.43255	gr/VMT		9.930938	gr/VMT		2.872786	gr/VMT
	2.3	miles/RT			1.6	#/day		1.4	#/day		0.4	#/day
	64.4	VMT/day										
					idle			idle			idle	
	3	min idle at crush			78.926	gr/hr		78.926	gr/hr		40.99567	gr/hr
	3	min idle at Stock			0.5	#/day		0.5	#/day		0.3	#/day
	6	min idle/RT										
	168	min idle/day			total crusher-stockpile			total crusher-stockpile			total crusher-stockpile	
	2.8	**hrs idle/day**			**2.1**	**#/day**		**1.9**	**#/day**		**0.7**	**#/day**
					Total daily on-road			Total daily on-road			Total daily on-road	
					59.4	**#/day**		**52.6**	**#/day**		**16.9**	**#/day**

Big Tujunga Reservoir Sediment Removal																
	Fugitive PM10 from Hauling - Existing Roads															
			Paved road							**Unpaved road**						
			EF=k(sl)^0.91(W)^1.02							EF=k(s/12)^ a(W/3)^b						
			Formula for emission factor (EF)							Formula for emission factor (EF)						
			from USEPA AP-42 13.2.1 Paved Roads							from USEPA AP-42, 13.2.2.2 Unpaved Roads, for industrial roads						
				k = particle size multiplier for particle size and units							k, a, and b are empirical constants					
				sL=road surface silt loading (g/m^2) - CalEEMod default							s=road surface material silt content (%)					
				W=average vehicle weight (tons)							W= mean vehicle weight (tons)					
				For PM10 and lb/VMT, k=0.0022 from AP-42 Table 13.2.1-1							For PM10, k=1.5, a=0.9, b=0.45 - from AP-42, Table 13.2.2-2					
	Haul truck weight assumed to be			30	tons											
	Reservoir to-from SPS						**Emission Factors**									
	400	trips daily	EF	k-PM10 #	sL	w				EF	k	s	W			
	2.2	miles res to SPS	0.008691	0.0022	0.1	30				3.132397	1.5	8.6	30			
	1.7	paved														
	0.5	unpaved		Haul truck weight assumed to be			30	tons								
	680	VMT/day/paved														
	200	VMT/day/unpaved					**Unmitigated Emissions**									
				Paved road				Unpaved road			Total					
				Emissions = EF*VMT												
				5.9	#/day			626.5	#/day		632.4	#/day				
	Reservoir from SPS						**Emission Factors**									
	400	trips daily	EF	k-PM10 #	sL	w				EF	k	s	W			
	2.8	miles SPS to res	0.003413	0.0022	0.1	12				2.073976	1.5	8.6	12			
	1.3	paved														
	1.5	unpaved		Haul truck weight assumed to be			12	tons								
	520	VMT/day/paved														
	600	VMT/day/unpaved					**Unmitigated Emissions**									
				Paved road				Unpaved road			Total					
				Emissions = EF*VMT												
				1.8	#/day			1244.4	#/day		1246.2	#/day				
	Crusher to-from Stockpile															
	28	RT daily														
	1.0	miles crsh to pile														
	0.7	paved														
	0.3	unpaved														
	1.3	miles pile to crush														
	0.7	paved														
	0.6	unpaved														
	1.4	total paved					**Unmitigated Emissions**									
	0.9	total unpaved		Paved road				Unpaved road			Total					
	39.2	VMT/day/paved		0.3	#/day			78.9	#/day		79.3	#/day				
	25.2	VMT/day/unpaved														
	Total Emissions															
		Unmitigated		**8.0**	**#/day**			**1949.8**	**#/day**		**1957.8**	**#/day**				
		Mitigation														
		Watering	55	percent reduction				1072.4	reduction							
		Mitigated		**8.0**	**#/day**			**877.4**	**#/day**		**885.4**	**#/day**				
	Conveyor Belt Option															
				0.3				78.9								
		Watering	55	percent reduction				43.4	reduction							
				0.3	**#/day**			**35.5**	**#/day**		**35.9**	**#/day**				

Big Tujunga Reservoir Sediment Removal															
	On-road Hauling EMFAC emissions - default fleet														
		EMFAC 2011													
On-road		2013 Estimated Seasonal Emission Rates													
		EMFAC 2007 Vehicle Categories													
		Summer Season													
		Los Angeles COUNTY													
		South Coast AIR BASIN													
		Area	CalYr	Season	Veh	Fuel	MdlYr	Speed	**ROG_RUN**	**CO_RUNE**	**NOX_RUN**	**PM10_RU**	**PM2_5_R**	**CO2_RUNEX**	
res-SPS								(Miles/hr)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	
400	RT daily	Los Angele	2013	Summer	T7	DSL	AllMYr	20	0.698244	2.892971	11.43255	0.319732	0.294153	2155.8552	
5	miles/RT														
2000	**VMT/day**						**emissions**	**pounds/day**	**3.1**	**12.7**	**50.4**	**1.4**	**1.3**	9497.2	
3	min idle at res														
3	min idle at SPS														
6	min idle/RT								6.749567	27.51088	78.92598	0.450009	0.414009	7416.7447	
2400	min idle/day														
40.0	**hrs idle/day**						**emissions**	**pounds/day**	**0.6**	**2.4**	**7.0**	**0.04**	**0.04**	653.46	
														10151	#/day
crusher-stockpile														156	days
28	RT daily													**718**	**MT/year**
2.3	miles/RT														
64.4	**VMT/day**						**emissions**	**pounds/day**	**0.1**	**0.4**	**1.6**	**0.05**	**0.04**	305.81	
3	min idle at crush														
3	min idle at Stock														
6	min idle/RT														
168	min idle/day														
2.8	**hrs idle/day**						**emissions**	**pounds/day**	**0.0**	**0.2**	**0.5**	**0.00**	**0.00**	45.74	
								TOTAL	**3.8**	**15.7**	**59.4**	**1.5**	**1.4**	10502.2	
														351.6	#/day
														156	days
														25	**MT/year**
					conveyor belt total				**0.1**	**0.6**	**2.1**	**0.0**	**0.0**		

Big Tujunga Reservoir Sediment Removal									
	Aggregate Processing and Storage Piles								
Aggregate Processing - Crushing and Screening									
	Emissions								
	E = EF x TP								
		E = emissions, pounds/day							
		EF= emission factor for each process - pounds/ton							
		TP = throughput - tons/day							
	Emission factors from USEPA AP-42 - 11.9.2 Crushed Stone Processing and Pulverized Mineral Processing								
		Table 11.19.2-2 for PM10							
		Tertiary crushing-controlled			0.00054	lb/ton	0.0024	unc	Per AP-42 Factors not available for PM2.5
		Screening-controlled			0.00074	lb/ton	0.0087		conservatively use PM10 factors
	TP								
		CY/day	224	per DPW					
		tons/CY	1.35						
		tons/day	302.4						
	Emissions					uncontrolled			
		crushing	0.16	lb/day		0.73			
		screening	0.22	lb/day		2.63			
		Total	**0.39**			**3.36**			
Storage Piles									
	E=EF x A x (1-C)								
		E = emissions, pounds/day							
		EF= emission factor - pounds/acre/day							
		A = area of storage pile - acres							
		C = control factor - percent/100							
	Emission factors from USEPA AP-42								
		Inactive piles		1.7	lb/acre/day				Per AP-42 Factors not available for PM2.5
		Active piles		6.3	lb/acre/day				conservatively use PM10 factors
	Areas - assumed for this calculation								
		Inactive piles		2	acres				
		Active piles		0.25	acres				
	Control factor with watering or chemical suppression - suggested by SMAQMD								
		Inactive piles		0.8		0.5			
		Active piles		0.8		0.5			
	Emissions								
		Inactive piles		0.68	lb/day	1.7			
		Active piles		0.32	lb/day	0.79			
				1.00		**2.49**			

Big Tujunga Reservoir Sediment Removal										
	Truck Loading - Batch Drop - PM10									
Emissions										
E = EF x TP										
	E = emissions, pounds/day									
	EF=k x (0.0032) x ((U/5)^1.3)/((M/2)^1.4)				pounds/ton		From CalEEMod Appx A (and USEPA AP-42)			
		k = particle size constant								
		U = Wind speed- miles per hour								
		M = Moisture content - percent								
			k for PM10	0.35						
			U=	2.2	m/s	per CalEEMod for climate zone				
			convert to	4.9214	mph					
			M=	16	%	per DPW				
	TP = throughput - tons									
		for CY=	10000	cy/day		per Project plan				
			1.264	tons/CY		per CalEEMod				
		TP=	12642	tons/day						
	EF	5.9696E-05	pounds PM10/ton TP							
	TP	12642	tons TP/day							
	E	0.75	pounds PM10/day		per batch operation (truck load or unload)					
	Project will have		2	batch drops per trip; therefore						
	Batch drop emissions =			**1.51**	pounds per day					

Big Tujunga Reservoir Sediment Removal										
	Truck Loading - Batch Drop - PM2.5									
Emissions										
E = EF x TP										
	E = emissions, pounds/day									
	EF=k x (0.0032) x ((U/5)^1.3)/((M/2)^1.4)				pounds/ton		From CalEEMod Appx A (from USEPA AP-42)			
		k = particle size constant								
		U = Wind speed- miles per hour								
		M = Moisture content - percent								
			k for PM2.5	0.053						
			U=	2.2	m/s	per CalEEMod for climate zone				
			convert to	4.9214	mph					
			M=	16	%	per DPW				
	TP = throughput - tons									
		for CY=	10000	cy/day		per Project plan				
			1.264	tons/CY		per CalEEMod				
		TP=	12642	tons/day						
	EF	9.0397E-06	pounds/ton	PM2.5						
	TP	12642	tons/day							
	E	0.11	pounds/day	per batch operation (truck load or unload)						
	Project will have		2	batch drops per trip; therefore						
	Batch drop emissions =			**0.23**	pounds per day					

Big Tujunga Reservoir Sediment Removal													
	Fugitive PM10 from Hauling - Paved Roads - water 3x daily												
			Paved road							Unpaved road			
			EF=k(sl)^0.91(W)^1.02							EF=k(s/12)^ a(W/3)^b			
			Formula for emission factor (EF)							Formula for emission factor (EF)			
			from USEPA AP-42 13.2.1 Paved Roads							from USEPA AP-42, 13.2.2.2 Unpaved Roads, for industrial roads			
				k = particle size multiplier for particle size and units							k, a, and b are empirical constants		
				sL=road surface silt loading (g/m^2) - CalEEMod default							s=road surface material silt content (%)		
				W=average vehicle weight (tons)							W= mean vehicle weight (tons)		
				For PM10 and lb/VMT, k=0.0022 from AP-42 Table 13.2.1-1							For PM10, k=1.5, a=0.9, b=0.45 - from AP-42, Table 13.2.2-2		
	Haul truck weight assumed to be			30	tons								
	Reservoir to-from SPS						**Emission Factors**						
	400	trips daily	EF	k-PM10 #	sL	w				EF	k	s	W
	2.2	miles res to SPS	0.008691	0.0022	0.1	30				3.132397	1.5	8.6	30
	2.035	paved											
	0.165	unpaved		Haul truck weight assumed to be			30	tons					
	814	VMT/day/paved											
	66	VMT/day/unpaved					**Unmitigated Emissions**						
				Paved road				Unpaved road			Total		
				Emissions = EF*VMT									
				7.1	#/day			206.7	#/day		213.8	#/day	
	Reservoir from SPS						**Emission Factors**						
	400	trips daily	EF	k-PM10 #	sL	w				EF	k	s	W
	2.8	miles SPS to res	0.003413	0.0022	0.1	12				2.073976	1.5	8.6	12
	2.635	paved											
	0.165	unpaved		Haul truck weight assumed to be			12	tons					
	1054	VMT/day/paved											
	66	VMT/day/unpaved					**Unmitigated Emissions**						
				Paved road				Unpaved road			Total		
				Emissions = EF*VMT									
				3.6	#/day			136.9	#/day		140.5	#/day	
	Crusher to-from Stockpile												
	28	RT daily											
	1.0	miles crsh to pile											
	1	paved											
	0	unpaved											
	1.3	miles pile to crush											
	0.97	paved											
	0.33	unpaved											
	1.97	total paved					**Unmitigated Emissions**						
	0.33	total unpaved		Paved road				Unpaved road			Total		
	55.16	VMT/day/paved		0.5	#/day			28.9	#/day		29.4	#/day	
	9.24	VMT/day/unpaved											
	Total Emissions												
		Unmitigated		**11.2**	**#/day**			**372.6**	**#/day**		**383.7**	**#/day**	
		Mitigation											
		Watering	61	percent reduction				227.3	reduction				
		Mitigated		**11.2**	**#/day**			**145.3**	**#/day**		**156.5**	**#/day**	

Big Tujunga Reservoir Sediment Removal													
	Fugitive PM2.5 from Hauling - Paved Roads - water 3x daily												
			<u>Paved road</u>							<u>Unpaved road</u>			
			EF=k(sl)^0.91(W)^1.02							EF=k(s/12)^ a(W/3)^b			
			Formula for emission factor (EF)							Formula for emission factor (EF)			
			from USEPA AP-42 13.2.1 Paved Roads							from USEPA AP-42, 13.2.2.2 Unpaved Roads, for industrial roads			
				k = particle size multiplier for particle size and units							k, a, and b are empirical constants		
				sL=road surface silt loading (g/m^2) - CalEEMod default							s=road surface material silt content (%)		
				W=average vehicle weight (tons)							W= mean vehicle weight (tons)		
				For PM2.5 and lb/VMT, k=0.00054 from AP-42 Table 13.2.1-1							For PM2.5, k=.15, a=0.9, b=0.45 - from AP-42, Table 13.2.2-2		
	Haul truck weight assumed to be			30	tons								
	Reservoir to-from SPS						**Emission Factors**						
	400	trips daily	EF	k-PM10 #	sL	w				EF	k	s	W
	2.2	miles res to SPS	0.002133	0.00054	0.1	30				0.31324	0.15	8.6	30
	2.035	paved											
	0.165	unpaved		Haul truck weight assumed to be			30	tons					
	814	VMT/day/paved											
	66	VMT/day/unpaved					**Unmitigated Emissions**						
				<u>Paved road</u>				<u>Unpaved road</u>			<u>Total</u>		
				Emissions = EF*VMT									
				1.7	#/day			20.7	#/day		22.4	#/day	
	Reservoir from SPS						**Emission Factors**						
	400	trips daily	EF	k-PM10 #	sL	w				EF	k	s	W
	2.8	miles SPS to res	0.000838	0.00054	0.1	12				0.207398	0.15	8.6	12
	2.635	paved											
	0.165	unpaved		Haul truck weight assumed to be			12	tons					
	1054	VMT/day/paved											
	66	VMT/day/unpaved					**Unmitigated Emissions**						
				<u>Paved road</u>				<u>Unpaved road</u>			<u>Total</u>		
				Emissions = EF*VMT									
				0.9	#/day			13.7	#/day		14.6	#/day	
	Crusher to-from Stockpile												
	28	RT daily											
	1.0	miles crsh to pile											
	1	paved											
	0	unpaved											
	1.3	miles pile to crush											
	0.97	paved											
	0.33	unpaved											
	1.97	total paved					**Unmitigated Emissions**						
	0.33	total unpaved		<u>Paved road</u>				<u>Unpaved road</u>			<u>Total</u>		
	55.16	VMT/day/paved		0.1	#/day			2.9	#/day		3.0	#/day	
	9.24	VMT/day/unpaved											
	Total Emissions												
		Unmitigated		**2.7**	**#/day**			**37.3**	**#/day**		**40.0**	**#/day**	
		<u>Mitigation</u>											
		Watering	61	percent reduction				22.7	reduction				
		Mitigated		**2.7**	**#/day**			**14.5**	**#/day**		**17.3**	**#/day**	

Big Tujunga Reservoir Sediment Removal													
	Fugitive PM10 from Hauling - Paved Roads - water to 75% reduction												
			Paved road							Unpaved road			
			EF=k(sl)^0.91(W)^1.02							EF=k(s/12)^ a(W/3)^b			
			Formula for emission factor (EF)							Formula for emission factor (EF)			
			from USEPA AP-42 13.2.1 Paved Roads							from USEPA AP-42, 13.2.2.2 Unpaved Roads, for industrial roads			
				k = particle size multiplier for particle size and units							k, a, and b are empirical constants		
				sL=road surface silt loading (g/m^2) - CalEEMod default							s=road surface material silt content (%)		
				W=average vehicle weight (tons)							W= mean vehicle weight (tons)		
				For PM10 and lb/VMT, k=0.0022 from AP-42 Table 13.2.1-1							For PM10, k=1.5, a=0.9, b=0.45 - from AP-42, Table 13.2.2-2		
	Haul truck weight assumed to be			30	tons								
	Reservoir to-from SPS						**Emission Factors**						
	400	trips daily	EF	k-PM10 #	sL	w				EF	k	s	W
	2.2	miles res to SPS	0.008691	0.0022	0.1	30				3.132397	1.5	8.6	30
	2.035	paved											
	0.165	unpaved		Haul truck weight assumed to be			30	tons					
	814	VMT/day/paved											
	66	VMT/day/unpaved					**Unmitigated Emissions**						
				Paved road				Unpaved road			Total		
				Emissions = EF*VMT									
				7.1	#/day			206.7	#/day		213.8	#/day	
	Reservoir from SPS						**Emission Factors**						
	400	trips daily	EF	k-PM10 #	sL	w				EF	k	s	W
	2.8	miles SPS to res	0.003413	0.0022	0.1	12				2.073976	1.5	8.6	12
	2.635	paved											
	0.165	unpaved		Haul truck weight assumed to be			12	tons					
	1054	VMT/day/paved											
	66	VMT/day/unpaved					**Unmitigated Emissions**						
				Paved road				Unpaved road			Total		
				Emissions = EF*VMT									
				3.6	#/day			136.9	#/day		140.5	#/day	
	Crusher to-from Stockpile												
	28	RT daily											
	1.0	miles crsh to pile											
	1	paved											
	0	unpaved											
	1.3	miles pile to crush											
	0.97	paved											
	0.33	unpaved											
	1.97	total paved					**Unmitigated Emissions**						
	0.33	total unpaved		Paved road				Unpaved road			Total		
	55.16	VMT/day/paved		0.5	#/day			28.9	#/day		29.4	#/day	
	9.24	VMT/day/unpaved											
	Total Emissions												
		Unmitigated		**11.2**	**#/day**			**372.6**	**#/day**		**383.7**	**#/day**	
		Mitigation											
		Watering	75	percent reduction				279.4	reduction				
		Mitigated		**11.2**	**#/day**			**93.1**	**#/day**		**104.3**	**#/day**	

Big Tujunga Reservoir Sediment Removal													
	Fugitive PM2.5 from Hauling - Paved Roads - water to 75% reduction												
			Paved road							Unpaved road			
			EF=k(sl)^0.91(W)^1.02							EF=k(s/12)^ a(W/3)^b			
			Formula for emission factor (EF)							Formula for emission factor (EF)			
			from USEPA AP-42 13.2.1 Paved Roads							from USEPA AP-42, 13.2.2.2 Unpaved Roads, for industrial roads			
				k = particle size multiplier for particle size and units							k, a, and b are empirical constants		
				sL=road surface silt loading (g/m^2) - CalEEMod default							s=road surface material silt content (%)		
				W=average vehicle weight (tons)							W= mean vehicle weight (tons)		
				For PM2.5 and lb/VMT, k=0.00054 from AP-42 Table 13.2.1-1							For PM2.5, k=.15, a=0.9, b=0.45 - from AP-42, Table 13.2.2-2		
	Haul truck weight assumed to be			30	tons								
	Reservoir to-from SPS						**Emission Factors**						
	400	trips daily	EF	k-PM10 #	sL	w				EF	k	s	W
	2.2	miles res to SPS	0.002133	0.00054	0.1	30				0.31324	0.15	8.6	30
	2.035	paved											
	0.165	unpaved		Haul truck weight assumed to be			30	tons					
	814	VMT/day/paved											
	66	VMT/day/unpaved					**Unmitigated Emissions**						
				Paved road				Unpaved road			Total		
				Emissions = EF*VMT									
				1.7	#/day			20.7	#/day		22.4	#/day	
	Reservoir from SPS						**Emission Factors**						
	400	trips daily	EF	k-PM10 #	sL	w				EF	k	s	W
	2.8	miles SPS to res	0.000838	0.00054	0.1	12				0.207398	0.15	8.6	12
	2.635	paved											
	0.165	unpaved		Haul truck weight assumed to be			12	tons					
	1054	VMT/day/paved											
	66	VMT/day/unpaved					**Unmitigated Emissions**						
				Paved road				Unpaved road			Total		
				Emissions = EF*VMT									
				0.9	#/day			13.7	#/day		14.6	#/day	
	Crusher to-from Stockpile												
	28	RT daily											
	1.0	miles crsh to pile											
	1	paved											
	0	unpaved											
	1.3	miles pile to crush											
	0.97	paved											
	0.33	unpaved											
	1.97	total paved					**Unmitigated Emissions**						
	0.33	total unpaved		Paved road				Unpaved road			Total		
	55.16	VMT/day/paved		0.1	#/day			2.9	#/day		3.0	#/day	
	9.24	VMT/day/unpaved											
	Total Emissions												
		Unmitigated		**2.7**	**#/day**			**37.3**	**#/day**		**40.0**	**#/day**	
		Mitigation											
		Watering	75	percent reduction				27.9	reduction				
		Mitigated		**2.7**	**#/day**			**9.3**	**#/day**		**12.1**	**#/day**	

Big Tujunga Reservoir Sediment Removal								
	Fugitive Dust and CO2e from Conveyor Belt							
Fugitive dust								
E=EF x A x (1-C)								
	E = emissions, pounds/day							
	EF= emission factor - pounds/acre/day				conveyor	7920	feet	long
	A = area of storage pile - acres					5	feet	wide
	C = control factor - percent/100				area	39600	sq ft	
						0.91	acre	
Emission factors from USEPA AP-42								
	Inactive piles		1.7	lb/acre/day				
	Active piles		6.3	lb/acre/day				
Areas - assumed for this calculation								
	Inactive piles		0	acres				
	Active piles		0.91	acres				
Control factor with watering or chemical suppression - suggested by SMAQMD								
	Inactive piles		0.8					
	Active piles		0.5		50% control			
Emissions								Per AP-42 Factors not available for PM2.5
	Inactive piles		0	lb/day				conservatively use PM10 factors
	Active piles		2.86	lb/day				
			2.86					
Electricity	**2,768,334**	kwh/year						
	2,768	MWH/yr			**CO2e**			
			#/yr	GWF	MT/yr			
CO2	641.26	lb/MWH	1775222	1	805.1			
CH4	0.029		80.3	21	0.8			
N2O	0.011		30.5	310	4.3			
					810.1			

Big Tujunga Reservoir Sediment Removal															
	On-road Hauling EMFAC emissions - 2010 engines														
		EMFAC 2011													
On-road		2013 Estimated Seasonal Emission Rates													
		EMFAC 2007 Vehicle Categories													
		Summer Season													
		Los Angeles COUNTY													
		South Coast AIR BASIN													
		Area	CalYr	Season	Veh	Fuel	MdlYr	Speed	**ROG_RUNI**	**CO_RUNEX**	**NOX_RUNI**	**PM10_RUN**	**PM2_5_RU**	CO2_RUNEX	
res-SPS								(Miles/hr)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	(gms/mile)	
400	RT daily	Los Angele	2013	Summer	T7	DSL	2010	20	0.309926	0.950677	2.872786	0.052675	0.048461	2121.911	
5	miles/RT														
2000	**VMT/day**						**running**	**emissions**	**1.4**	**4.2**	**12.7**	**0.2**	**0.2**	9347.6	
3	min idle at res														
3	min idle at SPS	**CY**	**Vehicle_Cl**	**Fuel_Type**	**Model_Yea**	**MY_Range**	**Season**								
6	min idle/RT	2013	T7	D	2010	2007-2040	s		6.969869	30.31873	39.64449	0.090838	0.083571	7453.273	
2400	min idle/day														
40.0	**hrs idle/day**						**idle**	**emissions**	**0.6**	**2.7**	**3.5**	**0.01**	**0.01**		
crusher-stockpile															
28	RT daily														
2.3	miles/RT														
64.4	**VMT/day**						**running**	**emissions**	**0.0**	**0.1**	**0.4**	**0.01**	**0.01**		
3	min idle at crush														
3	min idle at Stock														
6	min idle/RT														
168	min idle/day														
2.8	**hrs idle/day**						**idle**	**emissions**	**0.0**	**0.2**	**0.2**	**0.00**	**0.00**		
								TOTAL	**2.1**	**7.2**	**16.8**	**0.2**	**0.2**		

Big Tujunga Reservoir Sediment Removal 2013 - 052912

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
User Defined Industrial	1	User Defined Unit
User Defined Industrial	1	User Defined Unit

1.2 Other Project Characteristics

Urbanization Rural

Wind Speed (m/s) 2.2

Utility Company Southern California Edison

Climate Zone 9

Precipitation Freq (Days) 33

1.3 User Entered Comments

Project Characteristics -

~~Land Use - Big Tujunga Reservoir area = 83 acres.~~
~~Maple Canyon SPS area = 22 acres.~~

~~Construction Phase - Site and road prep 4/1-12/2013 6d/wk 11 days~~
~~Dry season work 4/13-15-16--10/10-11-12/2013 6d/wk 25 wk 155 days~~
Storm season transport 10/14/2013-4/4/2014 5d/wk 25 wk 125 days
Trips and VMT - ~~Worker trips-default 4 site, SPS, BTR~~
Est ~~10 for crush,~~ 5 for storm season
On-road Fugitive Dust -

Grading - On-road hauling not calculated with CalEEMod

Off-road Equipment - Storm season xport - 1 loader

3.6 Storm season, BTR to Sunland - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.33	2.15	1.66	0.00		0.18	0.18		0.18	0.18				0.03		243.76
Total	**0.33**	**2.15**	**1.66**	**0.00**		**0.18**	**0.18**		**0.18**	**0.18**				**0.03**		**243.76**

3.6 Storm season, BTR to Sunland - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.30	2.00	1.65	0.00		0.16	0.16		0.16	0.16				0.03		243.71
Total	**0.30**	**2.00**	**1.65**	**0.00**		**0.16**	**0.16**		**0.16**	**0.16**				**0.03**		**243.71**

Big Tujunga Reservoir Sediment Removal 2013 - 052912

Los Angeles-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
User Defined Industrial	1	User Defined Unit
User Defined Industrial	1	User Defined Unit

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Utility Company**	Southern California Edison
Climate Zone	9	**Precipitation Freq (Days)**	33		

1.3 User Entered Comments

Land Use - Big Tujunga Reservoir area = 68 acres.
Maple Canyon SPS area = 22 acres.

Construction Phase - Site and road prep 4/1-12/2013 6d/wk 11 days
Dry season work 4/14-15-15--10/11-11-12/2013 6d/wk 25 wk 155 days
Storm season transport 10/14/2013-4/4/2014 5d/wk 25 wk 125 days

Off-road Equipment - Big T Res - 4 excavators, 4 loaders

Off-road Equipment - SPS-1 excavator, 1 dozer, 4 loaders

Off-road Equipment - OFFROAD 2011 load factors
Road and site prep-1dozer, 4 loader/backhoe, 1 grader

Off-road Equipment - Crusher site- 2 20 hp generators, 2 hrs/day

Off-road Equipment - 4 front loaders, 1 dozer, 1 excavator, per info provided.

Off-road Equipment - Storm season xport - 1 loader

Trips and VMT - Worker trips-default 4 site, SPS, BTR
Est 10 for crush, 5 for storm season

On-road Fugitive Dust -

Grading - On-road hauling not calculated with CalEEMod

Construction Off-road Equipment Mitigation - 3x water, but sediment is wet; negligible dust
Off-road engine mit - all Tier 3

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2013	0.69	4.83	3.71	0.01	0.98	0.30	1.28	0.32	0.30	0.62			552.17	0.06	0.00	553.36
2014	0.01	0.08	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01			11.12	0.00	0.00	11.14
Total	**0.70**	**4.91**	**3.79**	**0.01**	**0.98**	**0.31**	**1.29**	**0.32**	**0.31**	**0.63**			**563.29**	**0.06**	**0.00**	**564.50**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2013	0.45	2.64	3.66	0.01	0.43	0.22	0.65	0.13	0.22	0.35			552.17	0.06	0.00	553.36
2014	0.01	0.05	0.08	0.00	0.00	0.01	0.01	0.00	0.01	0.01			11.12	0.00	0.00	11.14
Total	**0.46**	**2.69**	**3.74**	**0.01**	**0.43**	**0.23**	**0.66**	**0.13**	**0.23**	**0.36**			**563.29**	**0.06**	**0.00**	**564.50**

3.0 Construction Detail

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

3.2 Road and site preparation - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.03	0.00	0.03	0.02	0.00	0.02			0.00	0.00	0.00	0.00
Off-Road	0.02	0.17	0.11	0.00		0.01	0.01		0.01	0.01			16.02	0.00	0.00	16.05
Total	**0.02**	**0.17**	**0.11**	**0.00**	**0.03**	**0.01**	**0.04**	**0.02**	**0.01**	**0.03**			**16.02**	**0.00**	**0.00**	**16.05**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00			1.26	0.00	0.00	1.26
Total	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**			**1.26**	**0.00**	**0.00**	**1.26**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.01	0.00	0.01	0.01	0.00	0.01			0.00	0.00	0.00	0.00
Off-Road	0.01	0.09	0.10	0.00		0.01	0.01		0.01	0.01			16.02	0.00	0.00	16.05
Total	**0.01**	**0.09**	**0.10**	**0.00**	**0.01**	**0.01**	**0.02**	**0.01**	**0.01**	**0.02**			**16.02**	**0.00**	**0.00**	**16.05**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00			1.26	0.00	0.00	1.26
Total	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**			**1.26**	**0.00**	**0.00**	**1.26**

3.3 Maple SPS - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.67	0.00	0.67	0.28	0.00	0.28			0.00	0.00	0.00	0.00
Off-Road	0.30	2.27	1.46	0.00		0.13	0.13		0.13	0.13			220.91	0.02	0.00	221.42
Total	**0.30**	**2.27**	**1.46**	**0.00**	**0.67**	**0.13**	**0.80**	**0.28**	**0.13**	**0.41**			**220.91**	**0.02**	**0.00**	**221.42**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.01	0.01	0.12	0.00	0.02	0.00	0.02	0.00	0.00	0.00			17.74	0.00	0.00	17.76
Total	**0.01**	**0.01**	**0.12**	**0.00**	**0.02**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**			**17.74**	**0.00**	**0.00**	**17.76**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.26	0.00	0.26	0.11	0.00	0.11			0.00	0.00	0.00	0.00
Off-Road	0.19	1.17	1.37	0.00		0.09	0.09		0.09	0.09			220.91	0.02	0.00	221.42
Total	**0.19**	**1.17**	**1.37**	**0.00**	**0.26**	**0.09**	**0.35**	**0.11**	**0.09**	**0.20**			**220.91**	**0.02**	**0.00**	**221.42**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.01	0.01	0.12	0.00	0.02	0.00	0.02	0.00	0.00	0.00			17.74	0.00	0.00	17.76
Total	**0.01**	**0.01**	**0.12**	**0.00**	**0.02**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**			**17.74**	**0.00**	**0.00**	**17.76**

3.4 Big Tujunga Reservoir - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.21	0.00	0.21	0.02	0.00	0.02			0.00	0.00	0.00	0.00
Off-Road	0.31	2.23	1.69	0.00		0.15	0.15		0.15	0.15			246.09	0.03	0.00	246.63
Total	**0.31**	**2.23**	**1.69**	**0.00**	**0.21**	**0.15**	**0.36**	**0.02**	**0.15**	**0.17**			**246.09**	**0.03**	**0.00**	**246.63**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.01	0.01	0.16	0.00	0.03	0.00	0.03	0.00	0.00	0.00			23.65	0.00	0.00	23.68
Total	**0.01**	**0.01**	**0.16**	**0.00**	**0.03**	**0.00**	**0.03**	**0.00**	**0.00**	**0.00**			**23.65**	**0.00**	**0.00**	**23.68**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.08	0.00	0.08	0.01	0.00	0.01			0.00	0.00	0.00	0.00
Off-Road	0.21	1.30	1.77	0.00		0.12	0.12		0.12	0.12			246.09	0.03	0.00	246.63
Total	**0.21**	**1.30**	**1.77**	**0.00**	**0.08**	**0.12**	**0.20**	**0.01**	**0.12**	**0.13**			**246.09**	**0.03**	**0.00**	**246.63**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.01	0.01	0.16	0.00	0.03	0.00	0.03	0.00	0.00	0.00			23.65	0.00	0.00	23.68
Total	**0.01**	**0.01**	**0.16**	**0.00**	**0.03**	**0.00**	**0.03**	**0.00**	**0.00**	**0.00**			**23.65**	**0.00**	**0.00**	**23.68**

3.5 Seasonal stockpile, crush, transport - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.01	0.05	0.03	0.00		0.00	0.00		0.00	0.00			5.24	0.00	0.00	5.26
Total	**0.01**	**0.05**	**0.03**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**			**5.24**	**0.00**	**0.00**	**5.26**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.01	0.01	0.08	0.00	0.01	0.00	0.02	0.00	0.00	0.00			11.90	0.00	0.00	11.92
Total	**0.01**	**0.01**	**0.08**	**0.00**	**0.01**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**			**11.90**	**0.00**	**0.00**	**11.92**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00			5.24	0.00	0.00	5.26
Total	**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**			**5.24**	**0.00**	**0.00**	**5.26**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.01	0.01	0.08	0.00	0.01	0.00	0.02	0.00	0.00	0.00			11.90	0.00	0.00	11.92
Total	**0.01**	**0.01**	**0.08**	**0.00**	**0.01**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**			**11.90**	**0.00**	**0.00**	**11.92**

3.6 Storm season transport to Sunland - 2013

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.01	0.07	0.05	0.00		0.01	0.01		0.01	0.01			7.18	0.00	0.00	7.20
Total	**0.01**	**0.07**	**0.05**	**0.00**		**0.01**	**0.01**		**0.01**	**0.01**			**7.18**	**0.00**	**0.00**	**7.20**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00			2.17	0.00	0.00	2.18
Total	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**			**2.17**	**0.00**	**0.00**	**2.18**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.01	0.04	0.05	0.00		0.00	0.00		0.00	0.00			7.18	0.00	0.00	7.20
Total	**0.01**	**0.04**	**0.05**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**			**7.18**	**0.00**	**0.00**	**7.20**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00			2.17	0.00	0.00	2.18
Total	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**			**2.17**	**0.00**	**0.00**	**2.18**

3.6 Storm season transport to Sunland - 2014

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.01	0.08	0.06	0.00		0.01	0.01		0.01	0.01			8.57	0.00	0.00	8.59
Total	**0.01**	**0.08**	**0.06**	**0.00**		**0.01**	**0.01**		**0.01**	**0.01**			**8.57**	**0.00**	**0.00**	**8.59**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00			2.55	0.00	0.00	2.56
Total	**0.00**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**			**2.55**	**0.00**	**0.00**	**2.56**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.01	0.05	0.06	0.00		0.00	0.00		0.00	0.00			8.57	0.00	0.00	8.59
Total	**0.01**	**0.05**	**0.06**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**			**8.57**	**0.00**	**0.00**	**8.59**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00	0.00
Worker	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00			2.55	0.00	0.00	2.56
Total	**0.00**	**0.00**	**0.02**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**			**2.55**	**0.00**	**0.00**	**2.56**

APPENDIX B-1

BIOLOGICAL CONTRAINTS LETTER REPORT

June 20, 2011

Mr. Ramil Parial
Water Resources Division
Department of Public Works
County of Los Angeles
900 South Fremont Avenue
Alhambra, California 91802-1460

VIA EMAIL AND U.S. MAIL
RPARIAL@dpw.lacounty.gov

Subject: Biological Constraints Survey for the Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project in Los Angeles County, California

Dear Mr. Parial:

This Letter Report presents the findings of a biological constraints survey for the Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project in unincorporated Los Angeles County, California. The study area for this survey consists of the proposed sediment removal area within the reservoir, the haul route downstream of Big Tujunga Dam, and the proposed fill areas within the existing Maple Canyon Sediment Placement Site (SPS) with a 100-foot buffer around these areas (Exhibit 1). Project limits were provided by the Los Angeles County Department of Public Works (LACDPW). The purpose of the survey was to evaluate existing biological resources and determine the potential for the occurrence of special status plant and wildlife species or other sensitive biological resources.

PROJECT DESCRIPTION AND LOCATION

The proposed project involves the dewatering of the Big Tujunga Reservoir and the removal of sediment to the nearby Maple Canyon SPS. Sediment from the reservoir will be placed on top of 10 acres of previously filled area and 22 previously undisturbed acres within the SPS. A maximum of 4,400,000 cubic yards of sediment would be removed from the reservoir, with excavation to the original cut template at 2,142.5 feet above mean sea level (msl) to achieve its original design capacity.

The study area extends approximately two river miles upstream and one river mile downstream of Big Tujunga Dam in Big Tujunga Canyon and includes Maple Canyon SPS. The study area is located on the southern edge of the San Gabriel Mountains, within the Angeles National Forest, and is located on the U.S. Geological Survey (USGS) Condor Peak 7.5-minute topographic quadrangle (Exhibit 2). The topography steeply slopes down into the canyon; elevations range from approximately 2,150 to 3,400 feet above msl. Soils in the study area consist of Trigo, granitic substratum-Modjeska families association (5 to 60 percent slopes), Rock outcrop-Chilao family-Haploxerolls, warm association (15 to 120 percent slopes), Typic Xerorthents, warm (55 to 90 percent slopes), and Olete-Kilburn-Etsel families complex (50 to 80 percent slopes) (Exhibit 3). Surrounding land uses include open space.

The *County of Los Angeles General Plan* designates Significant Ecological Areas (SEAs) as ecologically important or fragile land and water areas valuable as plant and animal communities. The study area is not located within any SEAs.

METHODS

BonTerra Consulting Senior Biologist Sam Stewart and Biologist/Regulatory Technician Allison Rudalevige conducted a general plant and wildlife survey within Maple Canyon SPS and areas downstream of the dam on April 14, 2011. Senior Botanist Robert Allen and Consulting Biologist Dave Bramlet conducted a general plant and wildlife survey upstream of the dam on April 20, 2011. Areas upstream of the dam were assessed with binoculars due to access limitations. The California Native Plant Society's (CNPS') Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2011) and the California Department of Fish and Game's (CDFG's) California Natural Diversity Database (CNDDB) (CDFG 2011) were reviewed prior to the survey to identify special status plants, wildlife, and habitats known to occur in the vicinity of the proposed project. Database searches included the USGS Sunland, Condor Peak, Chilao Flat, Burbank, Pasadena, and Mount Wilson 7.5-minute quadrangles.

All species observed were recorded in field notes. Plant species were identified in the field or collected for subsequent identification using keys in Hickman (1993) and Munz (1974). Taxonomy follows Hickman (1993) and current scientific data (e.g., scientific journals) for scientific and common names. Nomenclature for vegetation types generally follows that of *The Vegetation Classification and Mapping Program: List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database* (CDFG 2003).

Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and debris. Birds were identified by visual and auditory recognition. Surveys for mammals were conducted during the day and included searching for and identifying diagnostic signs including scat, footprints, scratch-outs, dust bowls, burrows, and trails. Taxonomy and nomenclature for wildlife generally follows Fisher and Case (1997) for amphibians and reptiles, American Ornithologists Union (1998) for birds, and Baker et al. (2003) for mammals.

SURVEY RESULTS

Vegetation Types

The following vegetation types and land covers were observed in the study area: chaparral (with chamise chaparral, scrub oak chaparral, and mixed chaparral subassociations), California annual grassland, willow riparian forest, coast live oak stands, open water, cliff, and developed. Many of these areas were burned in the 2009 Station Fire but are now recovering. Representative photographs of the study area are provided in Attachment A.

Chaparral

Chaparral vegetation is the most common vegetation type within the study area, occurring along most canyon slopes. This vegetation type is highly variable and has been delineated into various subassociations. The following subassociations were observed in the study area: (1) chamise chaparral; (2) scrub oak chaparral; and (3) mixed chaparral. Chamise chaparral occurs along most of the canyon slopes in the study area. This vegetation type has a relatively open canopy and is dominated by the large shrubs chamise (*Adenostoma fasciculatum*) and thick-leaf yerba santa (*Eriodictyon crassifolium*). Scrub oak chaparral occurs on the north-facing slopes in the Maple Canyon SPS. This vegetation type is dominated by scrub oak (*Quercus berberidifolia*) that was previously burned and is currently regrowing. The understory includes species such as California poppy (*Eschscholzia californica*), ripgut brome (*Bromus diandrus*), and foxtail chess (*Bromus madritensis* ssp. *rubens*). Mixed chaparral occurs on canyon slopes throughout the study area. These areas contain a mix of chaparral species and vegetative cover is sparser than in the chamise chaparral with more exposed rock and bare ground present. Most of the slopes on which this vegetation type is found burned during the Station Fire and shrubs and trees are commonly sprouting from the base. This vegetation type is expected to be impacted during sediment placement activities within Maple Canyon.

California Annual Grassland

California annual grassland occurs between the switchbacks of the access roads near the entrance to the dam facilities and the Maple Canyon SPS. This area has been previously used to deposit sediment from the reservoir. This vegetation type is dominated by a variety of non-native grasses including ripgut brome, foxtail chess, and wild oat (*Avena* sp.). Some scattered California poppy, Spanish broom (*Spartium junceum*), scrub oak, and pine (*Pinus* sp.) are also present. It is difficult to assess the extent to which this vegetation type burned during the Station Fire as annual grasses resprout very quickly after fire. This vegetation type is expected to be impacted during sediment placement activities within Maple Canyon.

Disturbed Freshwater Seep

Disturbed freshwater seep occurs downstream of Big Tujunga Reservoir on the slope north of the canyon bottom. While there is an underlying native component of species such as chamise, thick-leaf yerba santa, cryptantha (*Cryptantha* sp.), and deerweed (*Acmispon glaber* [*Lotus scoparius*]), the area contains a large proportion of non-native species such as Mediterranean schismus (*Schismus barbatus*), fescue (*Festuca* sp. [*Vulpia* sp.]), foxtail chess, ripgut brome, wild oat, red-stemmed filaree (*Erodium cicutarium*), and tree tobacco (*Nicotiana glauca*). The extent to which this vegetation type burned during the Station Fire was difficult to determine during the field survey. No impacts are expected to this vegetation type as it is outside of the proposed excavation limits.

Willow Riparian Forest

Willow riparian forest occurs at the canyon bottom downstream of the dam. This vegetation type is dominated by a mix of arroyo willow (*Salix lasiolepis*) and Goodding's black willow (*Salix gooddingii*) with an understory containing tree tobacco, ripgut brome, and chaparral nightshade (*Solanum xanti*). A few scattered white alder (*Alnus rhombifolia*) and Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) are also present. This vegetation type burned during the Station Fire and willow trees are re-sprouting from the base. No impacts are expected to this vegetation type as it is outside of the proposed excavation limits.

Coast Live Oak Stands

A few stands of coast live oak individuals occur in the study area. The stand along the access road between the Maple Canyon SPS and the remainder of the study area has an understory of chamise, yerba santa, Our Lord's candle (*Yucca whipplei*), black sage (*Salvia mellifera*), deerweed, and chaparral nightshade. The stand along the access road downstream of the dam contains a sparse understory of non-native grasses with much bare ground. No significant fire damage to oak trees was noted during the field survey. Vegetation along the proposed haul route is not expected to be impacted. Therefore no impacts are expected to this vegetation type.

Open Water

Open water occurs upstream of Big Tujunga Dam within the reservoir. Water levels were high at the time of the survey and made much of the canyon upstream of the dam inaccessible. Open water downstream of the dam that was flowing through the willow riparian forest is not included in this category because of the willow canopy and relatively limited extent of open water. The open water category is expected to disappear as the reservoir is dewatered prior to the initiation of project activities. The sediment below this category will be removed from the reservoir area to restore its original capacity.

Cliff

Cliff faces occur on the steep slopes throughout the study area. These areas are rocky and largely unvegetated. No impacts are expected to this vegetation type as it occurs outside of the proposed sediment excavation limits.

Ornamental

Ornamental plantings along the existing roads include common oleander (*Nerium oleander*), gum (*Eucalyptus* sp.), pine, and coast live oak. Vegetation along the proposed haul route is not expected to be impacted. Therefore no impacts are expected to this vegetation type.

Developed

Developed areas occur throughout the lower portion of the study area. This consists of the dam facilities, access roads, debris piles, concrete canyon walls, and riprap.

Additionally, tributaries at the upper end of the Maple Canyon SPS contain small areas of burned riparian herb, sycamore woodland, and willow riparian scrub; however, these areas are just beginning to resprout and therefore are not separated into individual vegetation types. These areas will be reassessed during the project's jurisdictional delineation to determine if they are under the jurisdiction of the resource agencies.

Special Status Vegetation Types

Willow riparian forest is the only vegetation type observed within the study area that would be considered special status by the resource agencies. Because this vegetation type is associated with a streambed feature, a permit from the CDFG would be required prior to disturbing or removing it. Impacts to this vegetation type may also be considered significant under the California Environmental Quality Act (CEQA), and mitigation may be required.

Additionally, while the coast live oak stands within the study area may not warrant mitigation as a vegetation type (due to their scattered distribution and overall limited acreage), removal of these trees may be subject to regulation by the U.S. Forest Service and/or the County of Los Angeles Oak Tree Ordinance.

No impacts to either of these vegetation types are anticipated as they are found outside of the project's disturbance limits.

Special Status Plant and Wildlife Species

Plants or wildlife may be considered to have "special status" due to declining populations, vulnerability to habitat change, or restricted distributions. Certain special status species have been listed as Threatened or Endangered under the California and/or Federal Endangered Species Acts.

Special Status Plants

Several special status plant species are known to occur or have historically occurred in the vicinity of the study area. Four of these species are federally and/or State-listed Threatened or Endangered species: Braunton's milk-vetch (*Astragalus brauntonii*), Nevin's barberry (*Berberis nevinii*), San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*), and slender-horned spineflower (*Dodecahema leptoceras*). Mount Gleason paintbrush (*Castilleja gleasonii*) is a State-listed Rare species. Of these species, potentially suitable habitat exists only for Nevin's barberry within the study area. Any impacts to this species, if present, would be considered significant.

In addition to species formally listed by the resource agencies, multiple species reported in the vicinity of the study area are CNPS List 1B and 2 plant species that may be considered constraints on development according to Section 15380 of the California Environmental Quality Act (CEQA). Potentially suitable habitat exists within the study area for slender mariposa lily (*Calochortus clavatus* var. *gracilis*), Plummer's mariposa lily (*Calochortus plummerae*), Parry's spineflower (*Chorizanthe parryi* var. *parryi*), California saw-grass (*Cladium californicum*), mesa horkelia (*Horkelia cuneata* ssp. *puberula*), California satintail (*Imperata brevifolia*), Davidson's bush-mallow (*Malacothamnus davidsonii*), California muhly (*Muhlenbergia californica*), white rabbit-tobacco (*Pseudognaphalium leucocephalum*), Greata's aster (*Symphyotrichum greatae*), San Bernardino aster (*Symphyotrichum defoliatum*), and Sonoran maiden fern (*Thelypteris puberula* var. *sonorensis*). Impacts on these species would be considered potentially significant depending on the size of the population, if present, relative to populations in the region.

Several of the species listed above are also listed as sensitive species for the Angeles National Forest by the U.S. Forest Service. These include slender mariposa lily, Plummer's mariposa lily, Parry's spineflower, mesa horkelia, California satintail, San Bernardino aster, and Sonoran maiden fern. One species, fragrant pitcher plant (*Lepechinia fragrans*), is listed as a sensitive species by the U.S. Forest Service (USFS), but is not a CNPS List 1B or 2 species.

CNPS Lists 3 and 4 species are not considered project constraints, and typically impacts on these species are considered less than significant and do not require mitigation. A summary of special status plant species is provided in Table 1.

TABLE 1
SPECIAL STATUS PLANT SPECIES
KNOWN TO OCCUR IN THE PROJECT REGION

Species	Status [1]				Likelihood for Occurrence
	USFWS	CDFG	CNPS	USFS	
Astragalus brauntonii Braunton's milk-vetch	FE		List 1B	–	Not expected to occur; outside known range
Berberis nevinii Nevin's barberry	FE	CE	List 1B	–	May occur; potentially suitable habitat present
Calochortus clavatus var. *gracilis* slender mariposa lily	–	–	List 1B	FSS	May occur; potentially suitable habitat present
Calochortus plummerae Plummer's mariposa lily	–	–	List 1B	FSS	May occur; potentially suitable habitat present
Castilleja gleasonii Mount Gleason paintbrush	–	–	List 1B	–	May occur; potentially suitable habitat present
Chorizanthe parryi var. *fernandina* San Fernandino Valley spineflower	FC	CE	List 1B	–	Not expected to occur; outside known range

TABLE 1 (Continued)
SPECIAL STATUS PLANT SPECIES
KNOWN TO OCCUR IN THE PROJECT REGION

Species	Status [1]				Likelihood for Occurrence
	USFWS	CDFG	CNPS	USFS	
Chorizanthe parryi var. *parryi* Parry's spineflower	–	–	List 1B	FSS	May occur; potentially suitable habitat present
Cladium californicum California saw-grass	–	–	List 2	–	May occur; potentially suitable habitat present
Dodecahema leptoceras slender-horned spineflower	FE	CE	List 1B	–	Not expected to occur; no potentially suitable habitat present
Horkelia cuneata ssp. *puberula* mesa horkelia	–	–	List 1B	FSS	May occur; potentially suitable habitat present
Imperata brevifolia California satintail	–	–	List 2	FSS	May occur; potentially suitable habitat present
Lepechinia fragrans fragrant pitcher plant	–	–	–	FSS	May occur; potentially suitable habitat present
Malacothamnus davidsonii Davidson's bush-mallow	–	–	List 1B	–	May occur; potentially suitable habitat present
Pseudognaphalium leucocephalum white rabbit-tobacco	–	–	List 2	–	May occur; potentially suitable habitat present
Symphyotrichum greatae Greata's aster	–	–	List 1B	–	May occur; potentially suitable habitat present
Symphyotrichum defoliatum San Bernardino aster	–	–	List 1B	FSS	May occur; potentially suitable habitat present
Thelypteris puberula var. *sonorensis* Sonoran maiden fern	–	–	List 2	FSS	May occur; potentially suitable habitat present

Status Definitions [1]

Federal (USFWS)
FE Endangered
FT Threatened
FC Candidate

State (CDFG)
CE Endangered
CT Threatened

California Native Plant Society (CNPS)
1A Plants Presumed Extinct in California
1B Plants Rare, Threatened, or Endangered in California/Elsewhere
2 Plants Rare, Threatened, or Endangered in California But More Common Elsewhere
3 Plants About Which We Need More Information – A Review List
4 Plants of Limited Distribution – A Watch List

Special Status Wildlife

Several special status wildlife species are known to occur in the vicinity of the study area (CDFG 2011). Three of these species are federally and/or State-listed Threatened or Endangered species with potentially suitable habitat occurring within the study area: Santa Ana sucker (*Catostomus santaanae*), arroyo toad (*Anaxyrus californicus*), and Sierra Madre yellow-legged frog (*Rana muscosa*). Any impacts on these species, if present, would be considered significant. A fourth species, the American peregrine falcon (*Falco peregrinus anatum*), was recently delisted by the U.S. Fish and Wildlife Service (USFWS) and the State, but it is still considered a State Fully Protected species. Impacts on the American peregrine falcon would only be considered significant if they consisted of impacts on nesting birds or loss of individual birds.

In addition to species formally listed by the resource agencies, additional special status species may occur within the study area that may constrain project activities. Potentially suitable habitat for the following species exists within the survey area: silvery legless lizard (*Anniella pulchra pulchra*), pallid bat (*Antrozous pallidus*), coastal whiptail (*Aspidoscelis tigris stejnegeri*), rosy boa (*Charina trivirgata*), black swift (*Cypseloides niger*), western pond turtle (*Emys marmorata*), western mastiff bat (*Eumops perotis californicus*), arroyo chub (*Gila orcuttii*), silver-haired bat (*Lasionycteris noctivagans*), hoary bat (*Lasiurus cinereus*), western yellow bat (*Lasiurus xanthinus*), San Diego desert woodrat (*Neotoma lepida intermedia*), big free-tailed bat (*Nyctinomops macrotis*), southern grasshopper mouse (*Onychomys torridus ramona*), coast (San Diego) horned lizard (*Phrynosoma coronatum blainvillii*, Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3), coast range newt (*Taricha torosa torosa*), and two-striped garter snake (*Thamnophis hammondii*). Impacts to these species would be considered potentially significant depending on the size of the population, if present, relative to populations in the region. A summary of special status wildlife species known to occur in the project region is provided in Table 2.

TABLE 2
SPECIAL STATUS WILDLIFE SPECIES
KNOWN TO OCCUR IN PROJECT REGION

Species	Status [1]			Likelihood for Occurrence
	USFWS	CDFG	USFS	
Fish				
Catostomus santaanae Santa Ana sucker	FT	CSC	FSS	May occur; potentially suitable habitat present
Gila orcuttii Arroyo chub	FSC	CSC	FSS	May occur; potentially suitable habitat present
Rhinichthys osculus ssp. 3 Santa Ana speckled dace	FSC	CSC	FSS	May occur; potentially suitable habitat present
Amphibians				
Anaxyrus californicus Arroyo southwestern toad	FE	CSC	–	May occur; potentially suitable habitat present
Rana muscosa Sierra Madre yellow-legged frog	FE	CSC	FSS	May occur; potentially suitable habitat present
Taricha torosa torosa Coast Range newt	–	CSC	–	May occur; potentially suitable habitat present
Reptiles				
Anniella pulchra pulchra Silvery legless lizard	–	CSC	FSS	May occur; potentially suitable habitat present
Aspidoscelis tigris stejnegeri Coastal whiptail	–	SA	–	Observed; suitable habitat present
Charina trivirgata Rosy boa	FSC	–	FSS	May occur; potentially suitable habitat present
Emys marmorata Western pond turtle	FSC	CSC	FSS	May occur; potentially suitable habitat present
Phrynosoma blainvillii Coast (San Diego) horned lizard	FSC	CSC	FSS	May occur; potentially suitable habitat present
Thamnophis hammondii Two-striped garter snake	FSC	CSC	FSS	Observed; suitable habitat present
Birds				
Athene cunicularia Burrowing owl	–	CSC	–	Not expected to occur, no suitable habitat present.
Cypseloides niger Black swift	–	CSC	–	May occur; potentially suitable habitat present

TABLE 2 (Continued)
SPECIAL STATUS WILDLIFE SPECIES
KNOWN TO OCCUR IN PROJECT REGION

Species	Status [1] USFWS	CDFG	USFS	Likelihood for Occurrence
Empidonax traillii extimus Southwestern willow flycatcher	FE	SE	FSS	Not expected to occur; no suitable habitat currently within study area due to recent fire
Falco peregrinus Peregrine falcon	–	CFP SCD	FSS	May occur; potentially suitable habitat present
Polioptila californica californica Coastal California gnatcatcher	FT	CSC	FSS	Not expected to occur, no suitable habitat present.
Vireo bellii pusillus Least Bell's vireo	FE	SE	FSS	Not expected to occur, no suitable habitat present, study area above elevational range
Mammals				
Antrozous pallidus Pallid bat	–	CSC	FSS	May occur; potentially suitable foraging habitat present
Eumops perotis californicus Western mastiff bat	–	CSC	–	May occur; potentially suitable foraging and roosting habitat present
Lasionycteris noctivagans Silver-haired bat	–	SA	–	May occur; potentially suitable foraging and roosting habitat present
Lasiurus cinereus Hoary bat	–	SA	–	May occur; potentially suitable foraging and roosting habitat present
Lasiurus xanthinus Western yellow bat	–	CSC	–	May occur; potentially suitable foraging and roosting habitat present
Lepus californicus bennettii San Diego black-tailed jackrabbit	–	CSC	–	Not expected to occur, no suitable habitat present.
Neotoma lepida intermedia San Diego desert woodrat	–	CSC	–	May occur; potentially suitable foraging habitat present
Nyctinomops macrotis Big free-tailed bat	–	CSC	–	May occur; potentially suitable foraging and roosting habitat present
Onychomys torridus ramona Southern grasshopper mouse	–	CSC	–	May occur; potentially suitable habitat present
Taxidea taxus American badger	–	CSC	–	Not expected to occur, no suitable habitat present.

Legend:

FEDERAL STATUS:

FE Federally Listed Endangered
FT Federally Listed Threatened
FC Federal Candidate
FSC Federal Species of Concern

FOREST SERVICE STATUS:

FSS Forest Service Sensitive Species

STATE STATUS:

SA Special Animal
SE State listed as endangered
ST State listed as threatened
SR State listed as rare
CSC California Department of Fish and Game Species of Concern
CFP California Fully Protected
SCD California (State) Candidate for Delisting

Note: Scientific and common names for wildlife species follow the most current list of Special Animals (July 2009) available from the California Department of Fish and Game (http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp).

Other Considerations

Much of the study area contains "Waters of the U.S." and "Waters of the State" that are under the jurisdiction of the U.S. Army Corps of Engineers (USACE), the State Water Quality Control Board, and the CDFG. A delineation of jurisdictional resources is needed in order to obtain regulatory permits prior to performing any work within these areas.

The Migratory Bird Treaty Act (MBTA) protects the nests of all native bird species, including common species such as mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), and house finch (*Carpodacus mexicanus*). Nesting birds have potential to occur in vegetation throughout the study area.

BIOLOGICAL CONSTRAINTS AND RECOMMENDATIONS

The following is a list of recommendations to ensure that the project is consistent with regulations protecting biological resources.

1. There is potential for several special status plant species to occur on the project site. Focused surveys to determine the presence/absence of special status plant species are recommended.

2. Potentially suitable habitat exists for three State and/or federally listed wildlife species: Santa Ana sucker, arroyo toad, and Sierra Madre yellow-legged frog. Focused surveys for these species are recommended to determine if they are present within the study area.

3. Potentially suitable habitat exists for several other special status species, including black swift, peregrine falcon, arroyo chub, Santa Ana speckled dace, silvery legless lizard, coastal whiptail, rosy boa, western pond turtle, coast (San Diego) horned lizard, two-striped garter snake, pallid bat, western mastiff bat, silver-haired bat, hoary bat, western yellow bat, big free-tailed bat, San Diego desert woodrat, and southern grasshopper mouse. The possible presence of these species is not a constraint to project activities, though avoidance/minimization measures may be required.

4. A delineation of jurisdictional resources is recommended to initiate the regulatory permitting process.

5. If oak trees will be removed or disturbed, a permit from the County of Los Angeles and/or USFS may be required.

6. Any vegetation removal activities should be planned outside of the nesting season for birds (generally March 15 through September 15) to ensure compliance with the MBTA. Nesting surveys would be needed prior to vegetation removal within the nesting season, and any active nests would require a buffer that may seriously constrain project activities.

Please contact David Hughes at (626) 351-2000 with any questions related to this report.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston
Principal, Biological Services

for
David T. Hughes
Project Manager

Attachment: A – Site Photographs
B – Plant and Wildlife Compendia

cc: Valerie de la Cruz, Water Resources Division
Crystal Franco P.E., Water Resources Division

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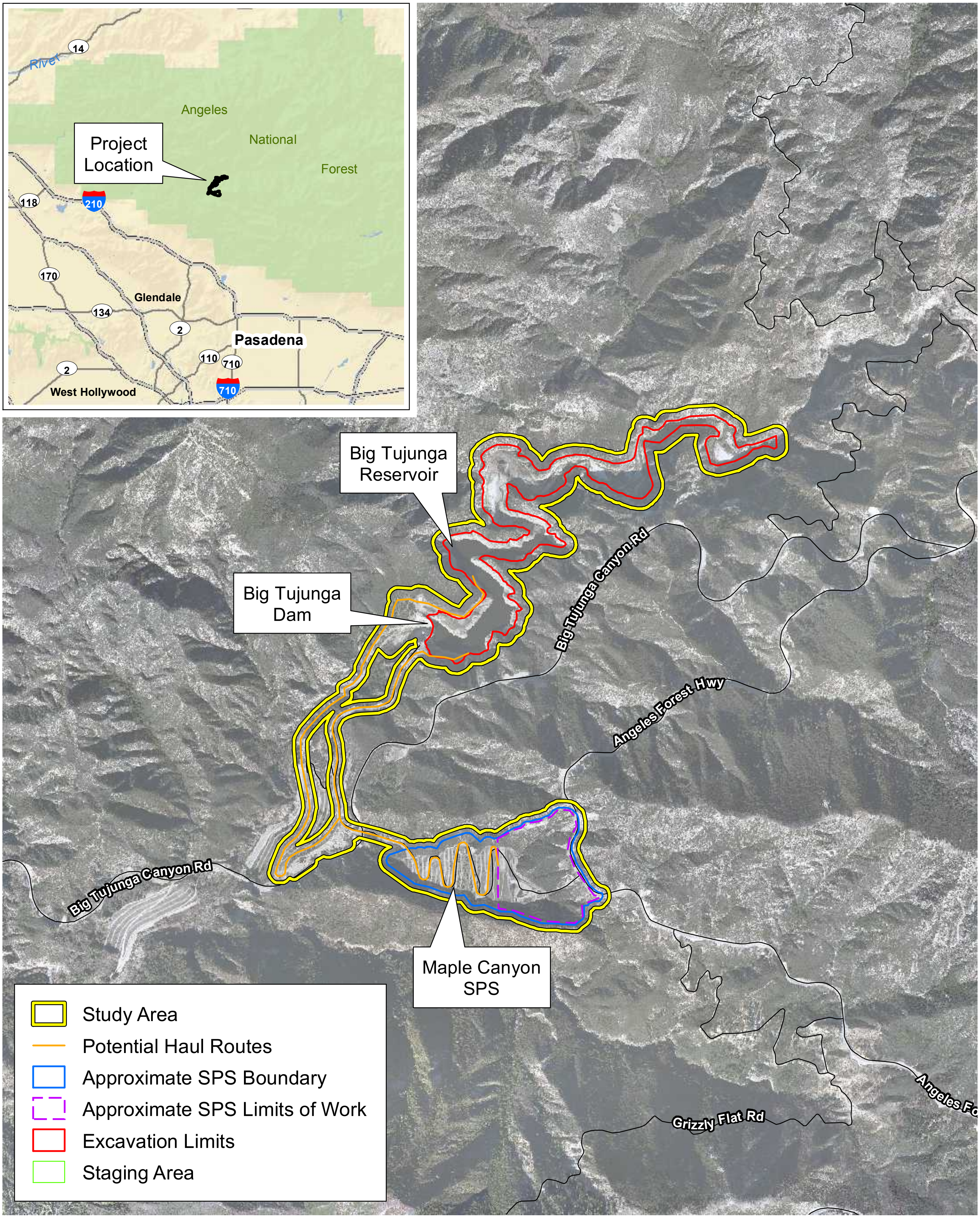

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Project Location

Exhibit 1

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

N W E S

2,000 1,000 0 2,000 Feet

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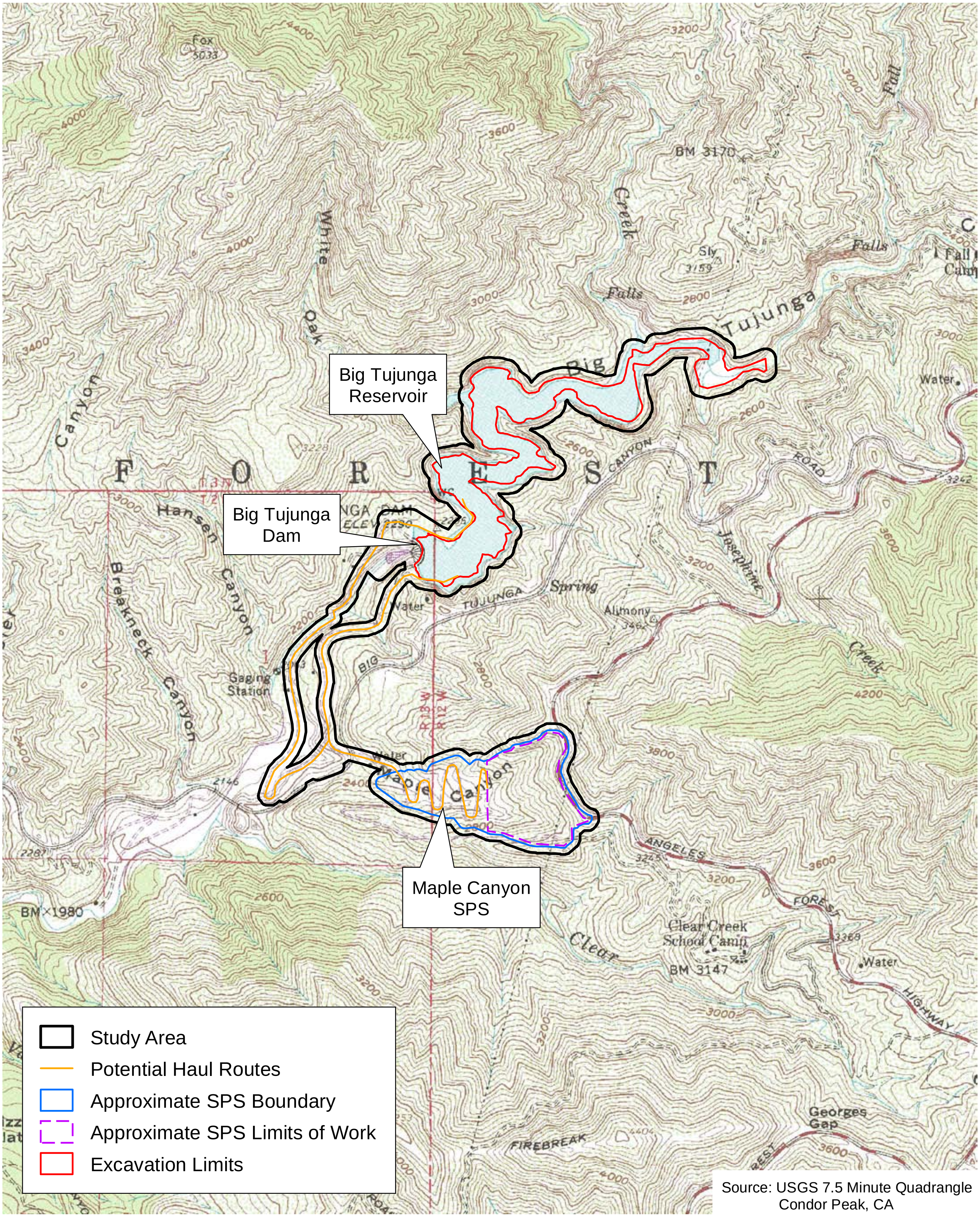

U.S. Geological Survey 7.5-Minute Quadrangle

Exhibit 2

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

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S

2,000 1,000 0 2,000
Feet

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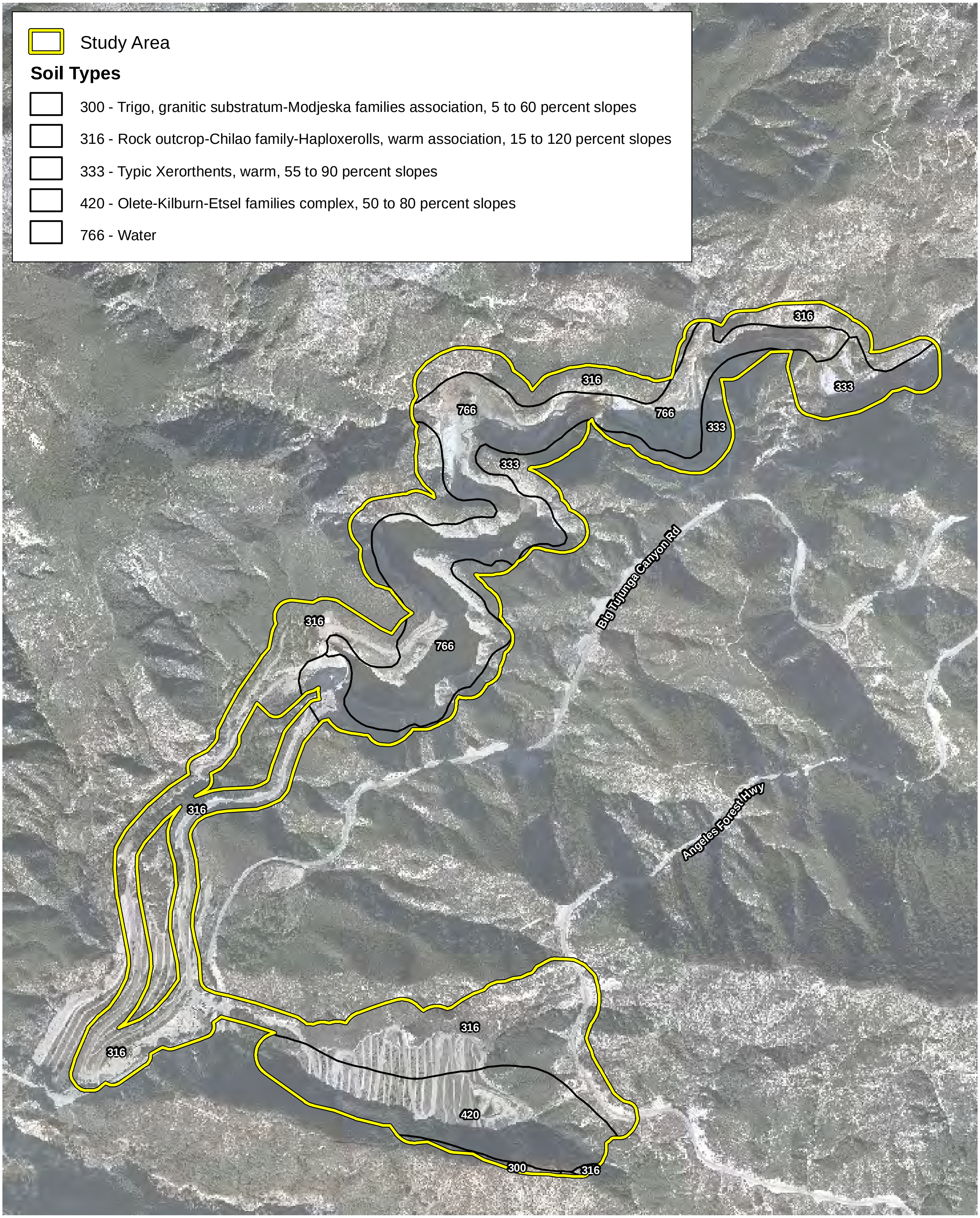

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Soil Types

Exhibit 3

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

N W E S

1,200 600 0 1,200 Feet

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ATTACHMENT A

SITE PHOTOGRAPHS

Chamise chaparral vegetation on the slopes near Big Tujunga Dam facing north. Note burn damage to tree at right from Station Fire.

Scrub oak chaparral on the slopes in the Maple Canyon Sediment Placement Site facing east. Note re-sprouting shrubs after Station Fire damage.

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Site Photographs

Attachment A-1

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

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California annual grassland in the Maple Canyon Sediment Placement Site facing north.

Willow riparian forest below Big Tujunga Dam facing north. Willow trees are re-sprouting after being burned by Station Fire.

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Site Photographs

Attachment A-2

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

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Pine trees along existing haul route. Note fire damage to trees at left.


Overview of Big Tujunga reservoir.

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Site Photographs

Attachment A-3

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

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ATTACHMENT B

PLANT AND WILDLIFE COMPENDIA

PLANT COMPENDIUM

"The following compendium is based on a reconnaissance-level survey and should be considered preliminary. Comprehensive plant and wildlife compendia will be provided with focused survey reports"

Species	
***PTERIDOPHYTES* - FERNS AND ALLIES**	
GYMNOSPERMS	
PINACEAE - PINE FAMILY	
Pinus sp.	pine
***ANGIOSPERMAE* - FLOWERING PLANTS**	
DICOTYLEDONES	
ANACARDIACEAE - SUMAC FAMILY	
Malosma laurina	laurel sumac
APOCYNACEAE - DOGBANE FAMILY	
*Nerium oleander**	common oleander
BETULACEAE - BIRCH FAMILY	
Alnus rhombifolia	white alder
BORAGINACEAE - BORAGE FAMILY	
Cryptantha sp.	cryptantha
Emmenanthe penduliflora	whispering bells
Eriodictyon crassifolium	thick-leaf yerba santa
Phacelia minor	wild canterbury-bell
CUCURBITACEAE - GOURD FAMILY	
Marah macrocarpus	chilicothe
ERICACEAE - HEATH FAMILY	
Arctostaphylos sp.	manzanita
FABACEAE (LEGUMINOSAE) - LEGUME FAMILY	
Acmispon glaber [Lotus scoparius]	deerweed
*Spartium junceum**	Spanish broom
FAGACEAE - OAK / BEECH FAMILY	
Quercus agrifolia	coast live oak
Quercus berberidifolia	scrub oak / California scrub oak
GERANIACEAE - GERANIUM FAMILY	
*Erodium cicutarium**	red-stemmed filaree
LAMIACEAE (LABIATAE) - MINT FAMILY	
Salvia mellifera	black sage
MYRTACEAE - MYRTLE FAMILY	
Eucalyptus sp.*	gum
PAPAVERACEAE - POPPY FAMILY	
Dendromecon rigida	bush poppy
Eschscholzia californica	California poppy
POLYGONACEAE - BUCKWHEAT FAMILY	
Eriogonum fasciculatum	California buckwheat
ROSACEAE - ROSE FAMILY	
Adenostoma fasciculatum	chamise
Cercocarpus betuloides var. betuloides	birch-leaf mountain-mahogany

PLANT COMPENDIUM (Continued)

Species	
SALICACEAE - WILLOW FAMILY	
Populus fremontii ssp. *fremontii*	Fremont cottonwood
Salix gooddingii	Goodding's black willow
Salix lasiolepis	arroyo willow
SOLANACEAE - NIGHTSHADE FAMILY	
*Nicotiana glauca**	tree tobacco
Solanum xanti	chaparral nightshade
MONOCOTYLEDONES **- MONOCOTS**	
AGAVACEAE - CENTURY PLANT FAMILY	
Hesperoyucca whipplei [Yucca whipplei]	Our Lord's candle
POACEAE [GRAMINEAE] - GRASS FAMILY	
Avena spp.*	wild oat
*Bromus diandrus**	ripgut grass
Bromus madritensis ssp. *rubens**	foxtail chess
*Festuca sp. [Vulpia sp.]**	fescue
*Piptatherum miliaceum**	smilo grass / millett ricegrass
*Schismus barbatus**	Mediterranean schismus
* non-native species	

WILDLIFE COMPENDIUM

"The following compendium is based on a reconnaissance-level survey and should be considered preliminary. Comprehensive plant and wildlife compendia will be provided with focused survey reports"

Species	
Birds	
ANATIDAE - WATERFOWL	
Anas platyrhynchos	mallard
FALCONIDAE - FALCONS	
Falco sparverius	American kestrel
APODIDAE - SWIFTS	
Aeronautes saxatalis	white-throated swift
TROCHILIDAE - HUMMINGBIRDS	
Calypte costae	Costa's hummingbird
TYRANNIDAE - TYRANT FLYCATCHERS	
Empidonax difficilis	Pacific-slope flycatcher
Sayornis nigricans	black phoebe
Myiarchus cinerascens	ash-throated flycatcher
VIREONIDAE - VIREOS	
Vireo cassinii	Cassin's vireo
CORVIDAE - CROWS & JAYS	
Aphelocoma californica	western scrub-jay
Corvus brachyrhynchos	American crow
Corvus corax	common raven
HIRUNDINIDAE - SWALLOWS	
Stelgidopteryx serripennis	northern rough-winged swallow
Petrochelidon pyrrhonota	cliff swallow
PARIDAE - TITMICE	
Baeolophus inornatus	oak titmouse
AEGITHALIDAE - BUSHTITS	
Psaltriparus minimus	bushtit
TROGLODYTIDAE - WRENS	
Thryomanes bewickii	Bewick's wren
PARULIDAE - WARBLERS	
Oreothlypis [*Vermivora*] *celata*	orange-crowned warbler
Dendroica petechia	yellow warbler
Dendroica coronata	yellow-rumped warbler
Dendroica nigrescens	black-throated gray warbler
Wilsonia pusilla	Wilson's warbler
EMBERIZIDAE - SPARROWS & JUNCOS	
Pipilo maculatus	spotted towhee
Melozone [*Pipilo*] *crissalis*	California towhee
Melospiza melodia	song sparrow
Junco hyemalis	dark-eyed junco

WILDLIFE COMPENDIUM (Continued)

Species	
CARDINALIDAE - CARDINALS & ALLIES	
Pheucticus melanocephalus	black-headed grosbeak
Passerina amoena	lazuli bunting
ICTERIDAE - BLACKBIRDS	
Molothrus ater	brown-headed cowbird
Icterus bullockii	Bullock's oriole
FRINGILLIDAE - FINCHES	
Carpodacus mexicanus	house finch
Spinus [Carduelis] psaltria	lesser goldfinch
Mammals	
CANIDAE - WOLVES & FOXES	
Urocyon cinereoargenteus	gray fox
MUSTELIDAE - WEASELS, SKUNKS & OTTERS	
Mephitis mephitis	striped skunk
CERVIDAE - DEER	
Odocoileus hemionus	mule deer

APPENDIX B-2

JURISDICTIONAL DELINEATION REPORT

JURISDICTIONAL DELINEATION REPORT

BIG TUJUNGA RESERVOIR
SEDIMENT REMOVAL PROJECT
LOS ANGELES COUNTY, CALIFORNIA

Prepared for

Water Resources Division
Department of Public Works
County of Los Angeles
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Alhambra, California 91802-1460
Contact: Philip Siongco

Prepared by

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July 2012
Updated February 2013

TABLE OF CONTENTS

TABLES

EXHIBITS

ATTACHMENTS

SECTION 1.0 INTRODUCTION

This Jurisdictional Delineation Report (report) was prepared for the Los Angeles County Department of Public Works, Water Resources Division to provide baseline data concerning the type and extent of resources under the jurisdiction of the U.S. Army Corps of Engineers (USACE), the California Department of Fish and Wildlife (CDFW[1]), and the Los Angeles Regional Water Quality Control Board (RWQCB) for the Big Tujunga Reservoir Sediment Removal Project (hereafter referred to as "the proposed project"). This Jurisdictional Delineation Report is based on the jurisdictional delineation surveys performed on September 28 and October 27, 2011.

1.1 PROJECT LOCATION AND DESCRIPTION

The proposed project is located in Big Tujunga Canyon in unincorporated Los Angeles County, within the boundaries of the Angeles National Forest (Exhibit 1). It is located on the U.S. Geological Survey's (USGS') Condor Peak 7.5-minute quadrangle of the San Bernardino Meridian at Township 3 North, Range 12 West, Sections 29, 31, and 32 (Exhibit 2). The study area for this jurisdictional delineation includes Big Tujunga Reservoir (which extends approximately two river miles upstream of Big Tujunga Dam), Big Tujunga Canyon Creek (which flows into the reservoir), the plunge pool immediately downstream of Big Tujunga Dam, Big Tujunga Wash (located downstream of the plunge pool for approximately one mile), and the Maple Canyon Sediment Placement Site (SPS) (Exhibit 3). Josephine Canyon Creek, White Oak Canyon Creek, and Fox Canyon Creek are smaller creeks that feed into Big Tujunga Reservoir, but only small portions of these creeks are within the survey area. The topography steeply slopes down into Big Tujunga canyon; elevations range from approximately 2,150 to 3,400 feet above mean sea level (msl).

1.2 REGULATORY AUTHORITY

1.2.1 SUMMARY OF REGULATIONS

U.S. Army Corps of Engineers

The USACE Regulatory Branch regulates activities that discharge dredged or fill materials into "waters of the U.S." under Section 404 of the Federal Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act. This permitting authority applies to all "waters of the U.S." where the material (1) replaces any portion of a "waters of the U.S." with dry land or (2) changes the bottom elevation of any portion of any "waters of the U.S.". These fill materials would include sand, rock, clay, construction debris, wood chips, and materials used to create any structure or infrastructure in these waters. The selection of disposal sites for dredged or fill material was done in accordance with Section 404(b)(1) guidelines, which were developed by the U.S. Environmental Protection Agency (USEPA).

Waters of the United States

"Waters of the U.S." can be divided into three categories: territorial seas, tidal waters, or non-tidal waters. The term "waters of the U.S." is defined by the *Code of Federal Regulations* (CFR, Title 33, Navigation and Navigable Waters; Part 328, Definition of waters of the United States; Section 328.3, Definitions) and includes those listed below.

[1] The California Department of Fish and Game (CDFW) changed its name to the California Department of Fish and Wildlife (CDFW) effective January 1, 2013.

1. All waters that have, are, or may be used in interstate or foreign commerce (including sightseeing or hunting), including all waters subject to the ebb and flow of the tide.
2. All interstate waters including interstate wetlands.
3. All other waters such as intrastate lakes, rivers, or streams (including intermittent streams); mudflats; sand flats; wetlands; sloughs; prairie potholes; wet meadows; playa lakes; or natural ponds where the use, degradation, or destruction of which could affect interstate or foreign commerce.
4. All impoundments of waters otherwise defined as “waters of the U.S.” under the definition.
5. All tributaries of waters identified above.
6. The territorial seas.
7. All wetlands adjacent to waters (other than waters that are themselves wetlands) identified above.

Ordinary High Water Mark

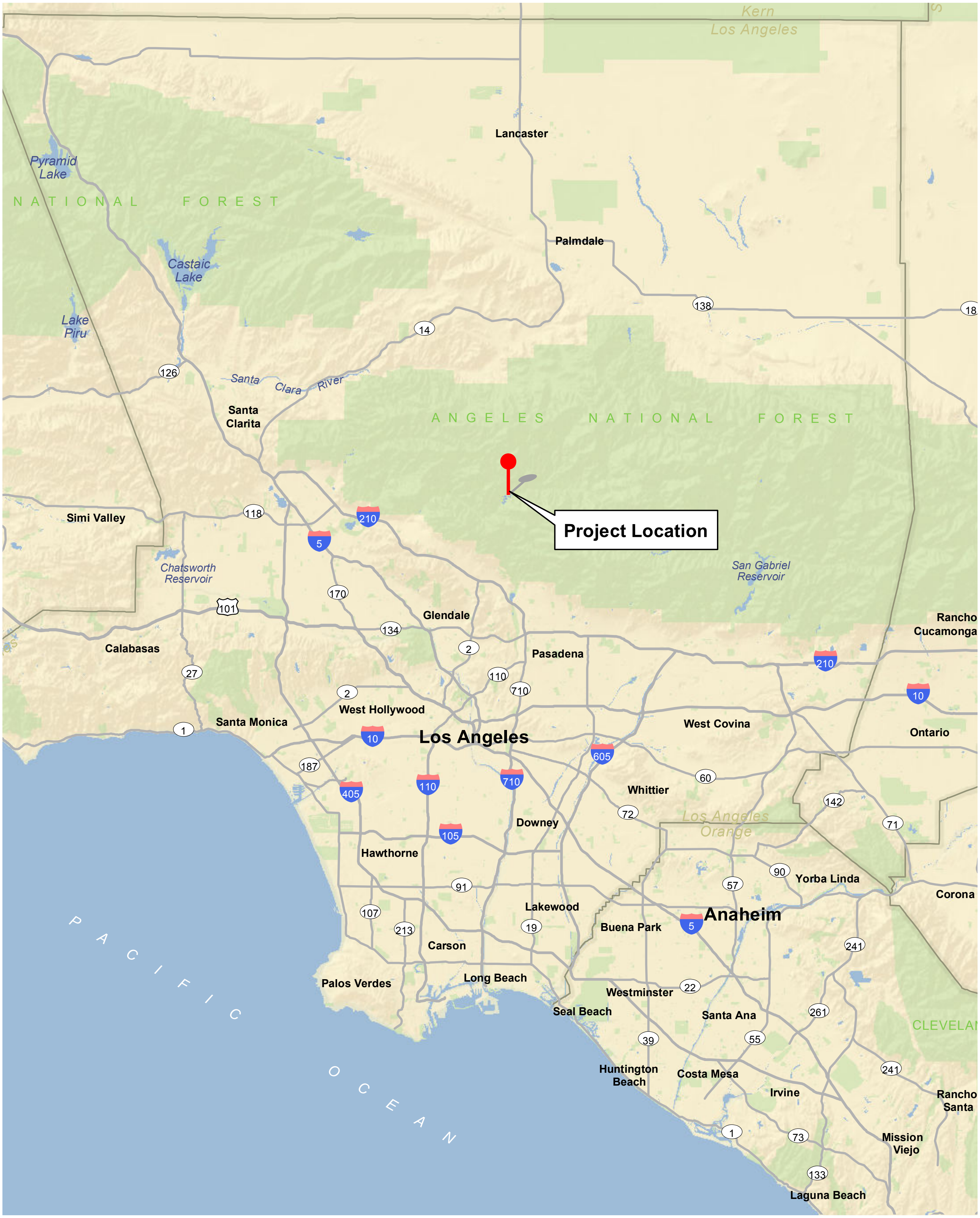
The landward limit of tidal “waters of the U.S.” is the high-tide line. In non-tidal waters where adjacent wetlands are absent, jurisdiction extends to the ordinary high water mark (OHWM). In the absence of wetlands in non-tidal waters, the extent of jurisdictional limits is determined by the OHWM. The OHWM is defined as “that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” (33 CFR §328.3[e]).

Wetlands

A wetland is a subset of jurisdictional waters and is defined by the USACE and the USEPA as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR §328.3[b]). Wetlands generally include swamps, marshes, bogs, and areas containing similar features. The definition and methodology for identifying wetland resources can be found in the USACE’s 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region,* a supplement to the USACE’s *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The methodology contained in this supplement was used to identify the type and extent of wetland resources within the boundaries of the project site.

On June 19, 2006, a majority of the U.S. Supreme Court overturned two Sixth Circuit Court of Appeals decisions, finding that certain wetlands constituted “waters of the U.S.” under the CWA. Justice Scalia argued that “waters of the U.S.” should not include channels through which water flows intermittently or ephemerally or channels that periodically provide drainage for rainfall. He also stated that a wetland may not be considered “adjacent to” remote “waters of the U.S.” based on a mere hydrologic connection. On June 5, 2007, the USACE published a memorandum that provides guidance to both the USEPA regions and the USACE districts that implement the Supreme Court’s decision in the Rapanos cases (which address the jurisdiction over “waters of the U.S.” under the CWA).[2] The memorandum includes a chart that summarizes

[2] Consolidated cases: *Rapanos v. United States* and *Carabell v. United States* refer to the U.S. Supreme Court’s decision concerning USACE jurisdiction over “waters of the U.S.” under the Clean Water Act.



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Regional Location

Exhibit 1

Big Tujunga Reservoir Sediment Removal Project

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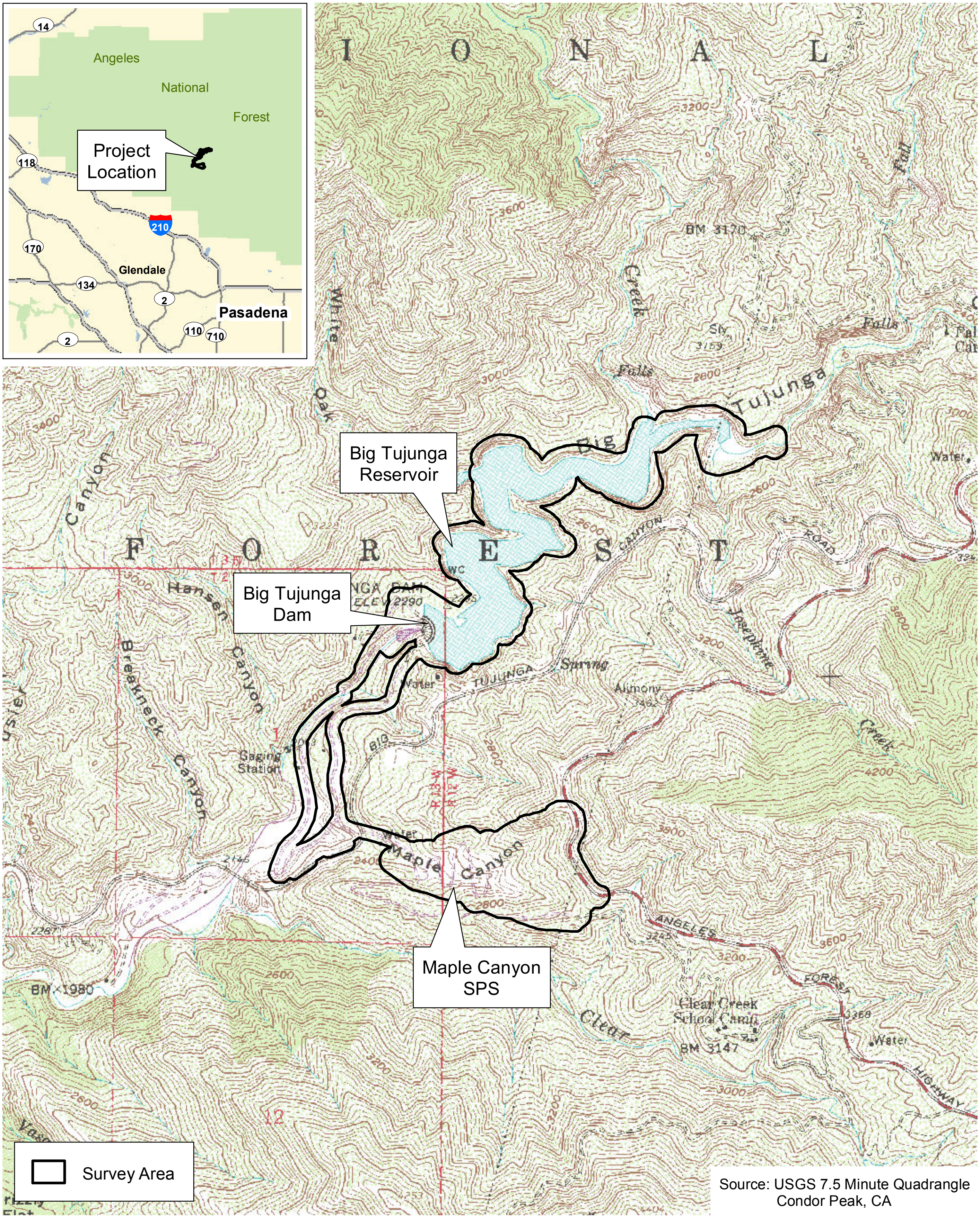

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U.S. Geological Survey 7.5-Minute Quadrangle

Exhibit 2

Big Tujunga Reservoir Sediment Removal Project

2,000 1,000 0 2,000 Feet

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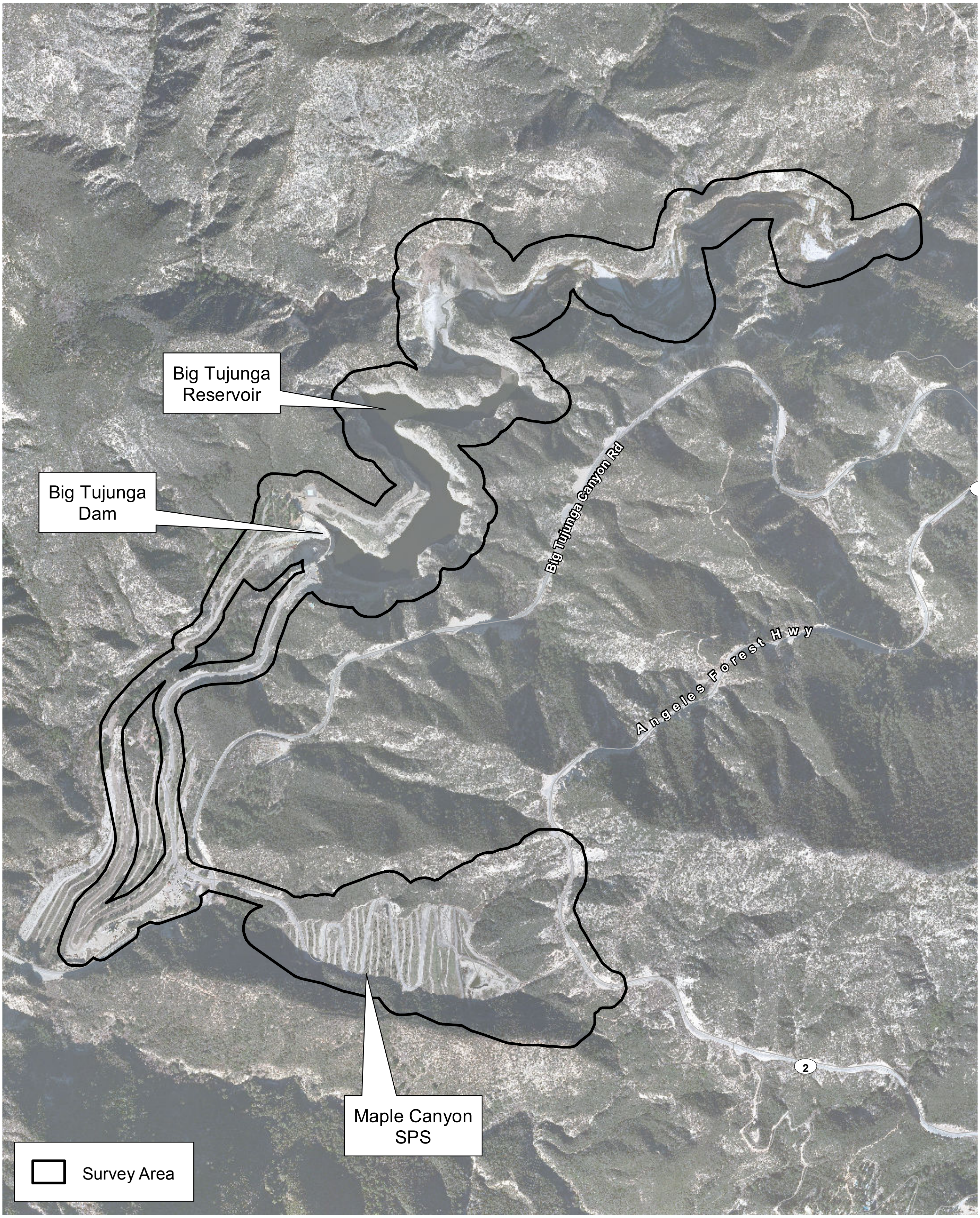

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Project Location

Exhibit 3

Big Tujunga Reservoir Sediment Removal Project

N W E S

1,200 600 0 1,200 Feet

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(Rev: 2-13-2013 CJS) R:\PAS\Projects\CoLADPW\J167\Graphics\JD_report\Ex3_LV_aerial.pdf its key points, which is intended to be used as a reference tool along with a complete discussion of issues and guidance furnished throughout the memorandum.

In summary, the USACE and the USEPA will assert jurisdiction over the following waters: (1) traditional navigable waters (TNW); (2) wetlands adjacent to a TNW; (3) relatively permanent, non-navigable tributaries of a TNW that typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and (4) wetlands that directly abut such tributaries.

The USACE and the USEPA will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have a significant nexus with a TNW: (1) non-navigable tributaries that are not relatively permanent; (2) wetlands adjacent to non-navigable tributaries that are not relatively permanent; and (3) wetlands adjacent to but that do not directly abut a relatively permanent, non-navigable tributary.

The USACE and the USEPA generally will not assert jurisdiction over the following features: (1) swales or erosional features (e.g., gullies or small washes characterized by low volume, infrequent, or short duration flow) and (2) ditches (including roadside ditches) excavated wholly within and draining only uplands and that do not carry a relatively permanent flow of water.

The USACE and the USEPA will apply the significant nexus standard defined as follows:

1. A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of downstream TNWs.
2. A significant nexus includes consideration of hydrologic and ecological factors.

Regional Water Quality Control Board

The RWQCB is the primary agency responsible for protecting water quality within California through the regulation of discharges to surface waters under the CWA and the California Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The RWQCB's jurisdiction extends to all "waters of the State" and to all "waters of the U.S.", including wetlands (isolated and non-isolated).

Section 401 of the CWA provides the RWQCB with the authority to regulate, through a Water Quality Certification, any proposed, federally permitted activity that may affect water quality. Among such activities are discharges of dredged or fill material permitted by the USACE pursuant to Section 404 of the CWA. Section 401 requires the RWQCB to provide "certification that there is reasonable assurance that an activity which may result in the discharge to 'waters of the U.S.' will not violate water quality standards". Water Quality Certification must be based on a finding that the proposed discharge will comply with water quality standards, which contain numeric and narrative objectives that can be found in each of the nine RWQCBs' Basin Plans.

The Porter-Cologne Act provides the State with very broad authority to regulate "waters of the State" (which are defined as any surface water or groundwater, including saline waters). The Porter-Cologne Act has become an important tool in the post-SWANCC (Solid Waste Agency of Northern Cook Counties vs. Unites States Corps of Engineers) and Rapanos era with respect to the State's authority over isolated waters. Generally, any person proposing to discharge waste into a water body that could affect its water quality must file a "Report of Waste Discharge" (ROWD) when there is no federal nexus, such as under Section 404(b)(1) of the

CWA. Although “waste” is partially defined as any waste substance associated with human habitation, the RWQCB interprets this to include fill discharge into water bodies.

Los Angeles Region Water Quality Control Plan

There are nine Regional Water Quality Control Boards in California. The project site is located within Regional Water Quality Control Board Region 4, the Los Angeles Region. The State Water Resources Control Board and the Regional Water Quality Control Board have adopted a Water Quality Control Plan (or “Basin Plan”) for the Los Angeles Region. The Basin Plan contains goals and policies, descriptions of conditions, and proposed solutions to surface and groundwater issues. The Basin Plan also establishes water quality standards for surface and groundwater resources and includes beneficial uses and levels of water quality that must be met and maintained to protect these uses. These water quality standards are implemented through various regulatory permits pursuant to CWA Section 401 for Water Quality Certifications and Section 402 for Report of Waste Discharge permits.

The Basin Plan indicates that the project site is located within the Los Angeles-San Gabriel River Hydrologic Unit, the San Fernando Hydrologic Area Split, and the Tujunga Hydrologic Subarea (HSA). Table 3-8 of the Basin Plan (Water Quality Objectives for Selected Constituents in Inland Surface Waters) indicates that the following numeric objectives have been established for this HSA: (1) Total Dissolved Solids (TDS), less than 350 milligrams per liter (mg/L); (2) sulfate, less than 50 mg/L; (3) chloride, less than 20 mg/L (Los Angeles RWQCB 1994).

The Basin Plan identifies a number of beneficial uses, some or all of which may apply to a specific HSA, including Municipal and Domestic Water Supply (MUN) waters; Agricultural Supply (AGR) waters; Industrial Service Supply waters (IND); Industrial Process Supply (PROC) waters; Groundwater Recharge (GWR) waters; Navigation (NAV) waters; Hydropower Generation (POW) waters; Water Contact Recreation (REC 1) waters; Non-Contact Water Recreation (REC 2) waters; Commercial and Sport Fishing (COMM) waters; Aquaculture (AQUA); Warm Fresh Water Habitat (WARM) waters; Cold Fresh Water Habitat (COLD) waters; Inland Saline Water Habitat (SAL); Preservation of Biological Habitats of Special Significance (BIOL) waters; Wildlife Habitat (WILD) waters; Rare, Threatened or Endangered Species (RARE) waters; Migration of Aquatic Organisms (MIGR); Spawning, Reproduction, or Early Development of Aquatic Organisms (SPWN); Marine Habitat (MAR) waters; Shellfish Harvesting (SHEL) waters; Estuarine Habitat (EST) waters; and Potential Presence of Wetlands (WET) (Los Angeles RWQCB 1994).

Based on the project site’s hydrologic and biological resources, existing beneficial uses for Big Tujunga Reservoir that are listed in the Basin Plan include Groundwater Recharge (GWR); Warm Fresh Water Habitat (WARM); Wildlife Habitat (WILD); and Spawning, Reproduction, or Early Development of Aquatic Organisms (SPWN). Potential beneficial uses include Municipal and Domestic Water Supply (MUN) and Cold Fresh Water Habitat (COLD). Possible effects to these existing and potential beneficial uses would need to be addressed as part of the request for a CWA Section 401 Water Quality Certification for this project.

GWR waters are used for natural or artificial recharge of groundwater for purposes that may include, but are not limited to, future extraction, maintaining water quality, or halting saltwater intrusion into freshwater aquifers. Perennial surface flows within Big Tujunga Canyon Creek flow into Big Tujunga Reservoir and infiltrate into the aquifer which is used for domestic potable water use. Flows that are released from Big Tujunga Reservoir flow through Big Tujunga Wash, ultimately reaching the Hansen Flood Control Basin for additional groundwater recharge.

WARM waters support warm water ecosystems that may include, but are not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife (including invertebrates). Big Tujunga Canyon Creek is a perennial stream that contains southern willow woodland and associated riparian resources that is utilized by wildlife. The proposed project activities will be implemented in a manner that will preserve these existing aquatic habitats, vegetation, fish, and wildlife resources consistent with this policy.

WILD waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife. As previously noted, Big Tujunga Canyon Creek provides wildlife habitat for waterfowl and other wildlife consistent with this policy.

SPWN waters support high quality aquatic habitats that are suitable for reproduction and early development of fish. The proposed project activities will be implemented in a manner that will preserve these existing aquatic habitats, vegetation, fish, and wildlife resources consistent with this policy.

MUN waters support community, military, or individual water supply systems including, but not limited to, drinking water supply. Big Tujunga Dam and Reservoir are part of water supply systems owned and operated that are the Los Angeles County Department of Public Works; both are consistent with the policy.

COLD waters support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates. The proposed project activities will be implemented in a manner that will preserve these existing cold water ecosystem resources containing aquatic habitats, vegetation, fish, and wildlife resources consistent with this policy.

RARE waters support habitats necessary, at least partially, for the survival and successful maintenance of plant or animal species established under State or federal law as Rare, Threatened, or Endangered. Surveys for special status species conducted by BonTerra Consulting in 2011 identified the following State or federal Threatened or Endangered species: (1) arroyo toad (*Anaxyrus californicus*) at the upstream end of Big Tujunga Reservoir (BonTerra Consulting 2011a) and (2) Santa Ana sucker (*Catostomus santaanae*) downstream of Big Tujunga Dam (BonTerra Consulting 2011b). Proposed project activities will be implemented in a manner that will protect these existing State and federally listed species consistent with this policy.

<u>California Department of Fish and Wildlife</u>

The CDFW has jurisdictional authority over wetland resources associated with rivers, streams, and lakes pursuant to the *California Fish and Game Code* (§1600–1616). Activities of State and local agencies as well as public utilities that are project proponents are regulated by the CDFW under Section 1602 of the *California Fish and Game Code;* this section regulates any work that will (1) substantially divert or obstruct the natural flow of any river, stream, or lake; (2) substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or (3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

Because the CDFW includes streamside habitats under its jurisdiction that, under the federal definition, may not qualify as wetlands on a particular project site, its jurisdiction may be broader than that of the USACE. Riparian forests in California often lie outside the plain of ordinary high water regulated under Section 404 of the CWA, and often do not have all three parameters (wetland hydrology, hydrophytic vegetation, and hydric soils) sufficiently present to be regulated as a wetland. However, riparian forests are frequently within CDFW regulatory jurisdiction under Section 1602 of the *California Fish and Game Code.*

The CDFW enters into a Lake or Streambed Alteration Agreement (SAA) with a project proponent and can impose conditions in the agreement. The notification process involves the completion of the applications that will serve as the basis for the CDFW's issuance of a Section 1602 SAA. Section 1602 of the *California Fish and Game Code* applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State.

The CDFW jurisdictional limits are not as clearly defined by regulation as those of the USACE. While they closely resemble the limits described by USACE regulations, they include riparian habitat supported by a river, stream, or lake regardless of the presence or absence of hydric and saturated soils conditions. In general, the CDFW takes jurisdiction from the top of a stream bank or to the outer limits of the adjacent riparian vegetation (outer drip line), whichever is greater. Notification is generally required for any project that will take place within or in the vicinity of a river, stream, lake, or their tributaries. This includes rivers or streams that flow at least periodically or permanently through a bed or channel with banks that support fish and other aquatic plant and/or wildlife species, and watercourses that have a surface or subsurface flow that support or have supported riparian vegetation.

SECTION 2.0 METHODOLOGY

The three-parameter approach used to identify USACE wetlands is summarized in Sections 2.1 through 2.3; literature reviewed for the preparation of the delineation is outlined in Section 2.4; and the field delineation is outlined in Section 2.5.

2.1 VEGETATION

Hydrophytic vegetation (or hydrophytes) is defined as any macrophytic plant that is typically adapted to and subsequently grows within water or that is on a substrate at least periodically deficient in oxygen; this oxygen deficiency can be a result of excessive saturation conditions that range from open water to periodically saturated soils. Specifically, these plant species are specialized and can survive in permanently saturated to periodically saturated soils where oxygen levels are very low or the soils are anaerobic. The U.S. Fish and Wildlife Service (USFWS) has identified approximately 2,000 plant species of this type within the State of California (i.e., Zone 0) and nearly 5,000 species throughout the U.S. (Reed 1988). The wetland indicator categories reflect the range of estimated probabilities (expressed as a frequency of occurrence) that a species occurs in wetlands versus non-wetlands. Therefore, a frequency of 67 percent to 99 percent means that 67 percent to 99 percent of sample plots containing the species randomly selected across the range of the species would be a wetland. A positive (+) or negative (-) sign is used with the wetland indicator categories to more specifically define the regional frequency of a species occurrence in wetlands (Reed 1988). The positive sign indicates a frequency toward the higher end of the category (i.e., more frequently found in wetlands), and a negative sign indicates a frequency toward the lower end of the category (less frequently found in wetlands). The positive and negative modifiers are eliminated from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* when determining if an area meets the hydrophytic plant criterion for a wetland. Species not listed by Reed (1988) are considered to be upland (UPL).

Plant indicator status categories are as follows:

- ***Obligate Wetland (OBL):*** Plants that occur almost always (estimated probability 99 percent) in wetlands under natural conditions, but which may also occur rarely (estimated probability 1 percent) in non-wetlands (e.g., cattails [*Typha* spp.] or common water hyacinth [*Eichhornia crassipes*]).
- ***Facultative Wetlands (FACW):*** Plants that occur usually (estimated probability 67-99 percent) in wetlands, but also occur (estimated probability 1–33 percent) in non-wetlands (e.g., mule fat [*Baccharis salicifolia*] or arroyo willow [*Salix lasiolepis*]).
- ***Facultative (FAC):*** Plants with similar likelihood (estimated probability 34–66 percent) of occurring in both wetlands and non-wetlands (e.g., California orach [*Atriplex californica*]).
- ***Facultative Upland (FACU):*** Plants that occur sometimes (estimated probability 1-33 percent) in wetlands, but occur more often (estimated probability 67–99 percent) in non-wetlands (e.g., giant wild rye [*Elymus condensatus*]).
- ***Obligate Upland (UPL):*** Plants that occur rarely (estimated probability 1 percent) in wetlands, but occur almost always (estimated probability 99 percent) in non-wetlands under natural conditions (e.g., coast live oak [*Quercus agrifolia*]).

The following are three procedures for determining hydrophytic vegetation: Indicator 1, “Dominance Test”, using the “50/20 Rule”; Indicator 2, “Prevalence Index”; or Indicator 3, “Morphological Adaptation”, as identified in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008c).

Hydrophytic vegetation is present if any indicator is satisfied. If none of the indicators are satisfied, then hydrophytic vegetation is absent unless (1) indicators of hydric soil and wetland hydrology are present and (2) the site meets the requirements for a problematic wetland situation.

Dominance Test: Vegetative cover is estimated and is ranked according to its dominance. Dominant species are the most abundant species for each stratum of the community (i.e., tree, sapling/shrub, herb, or woody vine) that individually or collectively amount to 50 percent of the total coverage of vegetation plus any other species that, by itself, accounts for 20 percent of the total vegetation cover (also known as the "50/20 Rule"). These species are recorded on the "Wetland Determination Data Form – Arid West Region" (see Attachment A). The wetlands indicator status of each species is also recorded on the data forms based on the *National List of Plant Species that Occur in Wetlands* (Reed 1988). If greater than 50 percent of the dominant species across all strata are OBL, FACW or FAC species, the criterion for wetland vegetation is considered to be met.

Prevalence Index: The prevalence index considers all plant species in a community, not just the dominant ones. The prevalence index is the average of the wetland indicator status of all plant species in a sampling plot. Each indicator status category is given a numeric code (OBL=1, FACW=2, FAC=3, FACU=4, and UPL=5) and is weighted by the species' abundance (percent cover). Hydrophytic vegetation is present if the prevalence index is 3.0 or less.

Morphological Adaptation: Morphological adaptations, such as adventitious roots (i.e., roots that take advantage of the wet conditions) and shallow root systems, must be observed on more than 50 percent of the individuals of a FACU species for the hydrophytic vegetation wetland criterion to be met.

2.2 SOILS

The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as a soil that is formed under conditions of saturation, flooding, or ponding that occurs long enough during the growing season to develop anaerobic conditions (or conditions of limited oxygen) at or near the soil surface and that favor the establishment of hydrophytic vegetation (USDA NRCS 2011). It should be noted that hydric soils created under artificial conditions of flooding and inundation sufficient for the establishment of hydrophytic vegetation would also meet this hydric soils indicator.

The soil conditions are verified by digging test pits along each transect to a depth of at least 20 inches (except where a restrictive layer occurs in areas containing hard pan, cobble, or solid rock). It should be noted that at some sites, it may be necessary to make exploratory soil test pits up to 40 inches deep to more accurately document and understand the variability in soil properties and hydrologic relationships on the site. Soil test pit locations are usually dug within the drainage invert or at the edge of a drainage course within vegetated areas. Soil extracted from each soil test pit is then examined for texture and color using the standard plates within the Munsell Soil Color Chart (1994) and recorded on the Data Form. The Munsell Soil Color Chart aids in designating soils by color labels based on gradations of three simple variables: hue, value, and chroma. Any indicators of hydric soils such as the following are also recorded on the Data Form: redoximorphic features (i.e., areas where iron is reduced under anaerobic conditions and oxidized following a return to aerobic conditions); buried organic matter; organic streaking; reduced soil conditions; gleyed (i.e., soils having a characteristic bluish-gray or greenish-gray in color) or low-chroma soils; or sulfuric odor. If hydric soils are found, progressive pits are dug along the transect, moving laterally away from the active channel area until hydric soil features are no longer present within the top 20 inches of the soil.

2.3 HYDROLOGY

Wetlands hydrology is represented by either (1) all of the hydrological elements or characteristics of areas permanently or periodically inundated or (2) areas containing soils that are saturated for a sufficient duration of time to create hydric soils suitable for the establishment of plant species that are typically adapted to anaerobic soil conditions. The presence of wetland hydrology is evaluated at each intersect by recording the extent of observed surface flows, the depth of inundation, the depth to saturated soils, and the depth to free water in soil test pits. In instances where stream flow is divided into multiple channels with intervening sandbars, the entire area between the channels is considered within the OHWM. Therefore, an area containing these features would meet the indicator requirements for wetland hydrology.

2.4 LITERATURE

Prior to conducting the delineation field investigations on September 29 and October 27, 2011, BonTerra Consulting reviewed the following documents to identify areas that may fall under agency jurisdiction: the USGS' Condor Peak 7.5-minute quadrangle; color aerial photography provided by Aerials Express (Spring 2009); the Report and General Soil Maps for the Angeles National Forest (USDA NRCS 2006); the National Hydric Soils List (USDA NRCS 2011); and the National Wetlands Inventory's (NWI) Wetland Mapper (USFWS 2011). A description of this literature is provided below.

USGS Topographic Quadrangle. USGS quadrangle maps show geological formations and their characteristics; they describe the physical settings of an area through topographic contour lines and other major surface features. These features include lakes, streams, rivers, buildings, roadways, landmarks, and other features that may fall under the jurisdiction of one or more regulatory agencies. In addition, the USGS maps provide topographic information that is useful in determining elevations, latitude and longitude, and Universal Transverse Mercator Grid coordinates for a project site.

The project site is shown on the USGS Condor Peak 7.5-minute quadrangle. Big Tujunga Canyon Creek and Big Tujunga Reservoir are identified on the quad map along with three blueline streams that drain into Big Tujunga Reservoir: Josephine Canyon Creek, White Oak Canyon Creek, and Fox Canyon Creek.

Color Aerial Photography. BonTerra Consulting reviewed an existing color aerial photograph prior to the September 29 and October 27, 2011, site visits to identify the extent of any drainages and riparian vegetation occurring on the project site.

Big Tujunga Canyon Creek, Big Tujunga Reservoir, Big Tujunga Wash, Josephine Canyon Creek, White Oak Canyon Creek, Fox Canyon Creek, and associated vegetation are visible on the aerial photograph.

U.S. Department of Agriculture, Natural Resources Conservation Service. The presence of hydric soils is one of the chief indicators of jurisdictional wetlands. BonTerra Consulting reviewed the U.S. Department of Agriculture (USDA) soil data for the project site (USDA NRCS 2007).

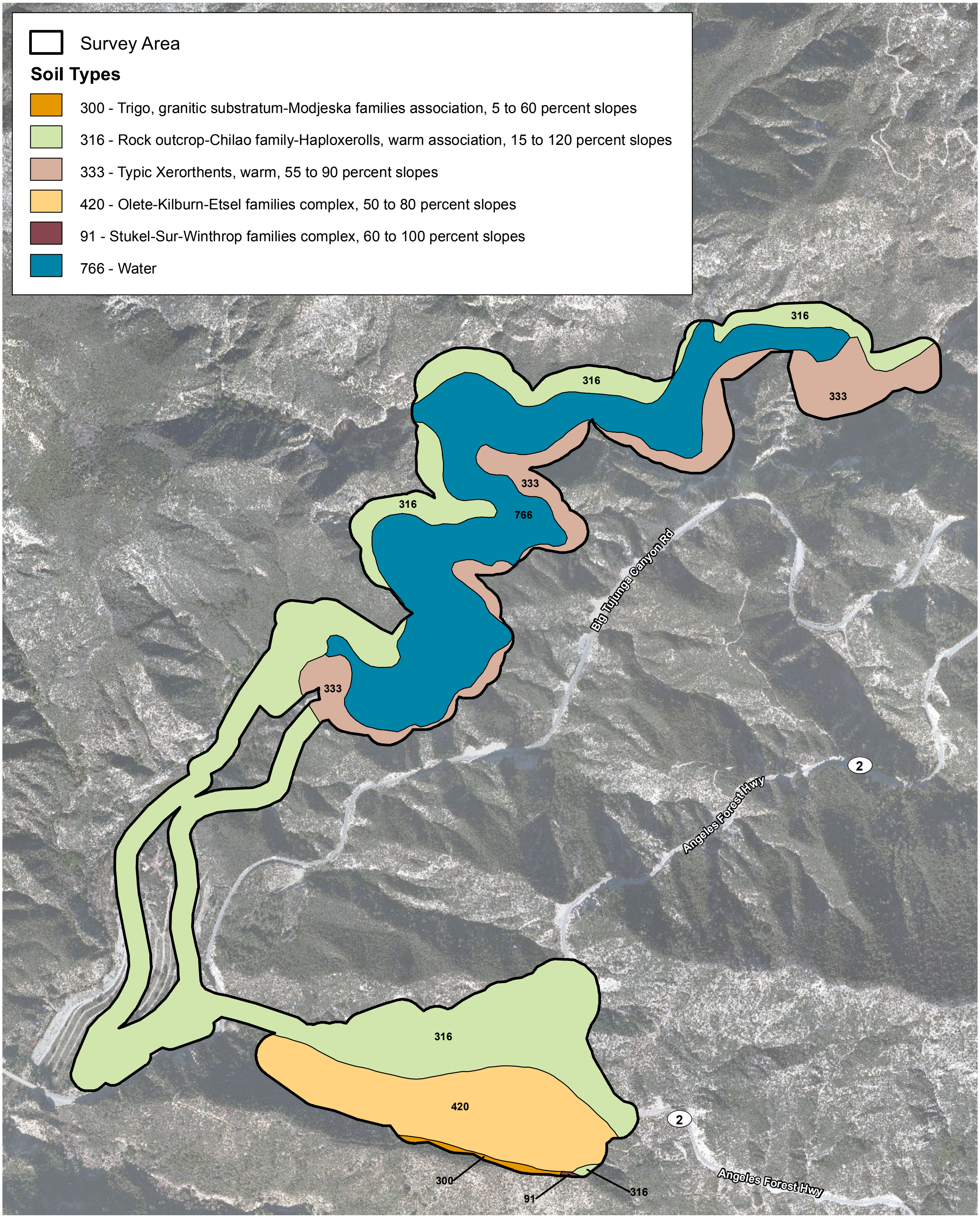
Soils within the project site are shown on Exhibit 4 and consist of Trigo, granitic substratum-Modjeska families association (5 to 60 percent slopes); Rock outcrop-Chilao family-Haploxerolls, warm association (15 to 120 percent slopes); Typic Xerorthents, warm (55 to 90 percent slopes); Olete-Kilburn-Etsel families complex (50 to 80 percent slopes); and Stukel-Sur-Winthrop families complex (60 to 100 percent slopes). No soils mapped on the project site are listed as "hydric" on the National Hydric Soils List (USDA NRCS 2011). Available descriptions of the soil series mapped on the project site are provided in Attachment B of this report.

U.S. Fish and Wildlife Service, National Wetlands Inventory. The NWI Wetlands Mapper shows wetland resources available from the Wetlands Spatial Data Layer of the National Spatial Data Infrastructure (USFWS 2011). This resource provides the classification of known wetlands following the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). This classification system is arranged in a hierarchy of (1) systems that share the influence of similar hydrologic, geomorphologic, chemical, or biological factors (i.e., Marine, Estuarine, Riverine, Lacustrine, and Palustrine); (2) subsystems (i.e., Subtidal and Intertidal; Tidal, Lower Perennial, Upper Perennial, and Intermittent; or Littoral and Limnetic); (3) classes, which are based on substrate material and flooding regime or on vegetative life forms; (4) subclasses; and (5) dominance types, which are named for the dominant plant or wildlife forms. In addition, there are modifying terms applied to Classes or Subclasses.

The mapped wetlands resources are included in Attachment C. Resources on the project site upstream of Big Tujunga Dam are mapped as L1UBK (identified with the outdated code L1OWKZ on the exhibit in Attachment C), L2FLKY, R3USK (R3SBZ in Attachment C), R3FLY, PSSW, and PFOY. Resources downstream of Big Tujunga Dam are mapped as PEMY and within Maple Canyon SPS as PFOY.

The description for codes L1UBK and L2FLKY is as follows:

- ***L: System LACUSTRINE*****.** The Lacustrine System includes wetlands and deepwater habitats with all of the following characteristics : (1) situated in a topographic depression or a dammed river channel; (2) lacking trees, shrubs, persistent emergent vegetation, emergent mosses, or lichens with greater than 30 percent areal coverage ; and (3) total area exceeds 20 acres.
    - ***1: Subsystem LIMNETIC.*** This subsystem includes all deepwater habitats (i.e., deeper than two meters) within the Lacustrine system.
        - ***UB: Class UNCONSOLIDATED BOTTOM.*** This class is characterized by wetland and deepwater habitats with at least 25 percent cover of particles smaller than stones, and a vegetative cover less than 30 percent. Water regimes are restricted to subtidal, permanently flooded, intermittently exposed, and semi-permanently flooded.
            - ***K: Water Regime Modifier ARTIFICIALLY FLOODED*****.** This modifier refers to inundated areas in which the amount and duration of flooding is controlled by means of pumps or siphons in combination with dikes or dams. Neither wetlands resulting from leakage from man-made impoundments, nor irrigated pasture lands supplied by diversion ditches or artesian wells, are included under this modifier.
    - ***2: Subsystem LITTORAL.*** This subsystem includes all wetland habitats in the Lacustrine System. The boundary of this subsystem extends from the shoreward boundary of the system to a depth of two meters below low water or to the maximum extent of non-persistent emergent vegetation, if growing at depths greater than two meters.
        - ***FL: Class FLATS*****.** This class is characterized by exposed sand or mud at low tide or low water stages and is not vegetated.
            - ***K: Water Regime Modifier ARTIFICIALLY FLOODED*****.** This modifier refers to inundated areas in which the amount and duration of flooding is controlled by means of pumps or siphons in combination with dikes or dams. Neither wetlands resulting from leakage from man-made impoundments, nor irrigated pasture



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Soil Types

Exhibit 4

Big Tujunga Reservoir Sediment Removal Project

N W E S

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Feet

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(Rev: 2-13-2013 CJS) R:\PAS\Projects\CoLADPW\J167\Graphics\JD_Report\Ex3_soils.pdf lands supplied by diversion ditches or artesian wells, are included under this modifier.

- ***Y: Water Regime Modifier SATURATED ON A SEMI-PERMANENT OR SEASONAL BASIS*.** This modifier refers to areas in which surface water persists throughout the growing season or for extended periods in most years. When surface water is absent, the water table is usually at or very near the land surface.

The description for codes R3FLY and R3USK is as follows:

- ***R: System RIVERINE*.** The Riverine System includes all wetlands and deep water habitats contained in natural or artificial channels periodically or continuously containing flowing water or which forms a connecting link between the two bodies of standing water. Upland islands or Palustrine wetlands may occur in the channel, but they are not part of the Riverine System.
    - ***3: Subsystem UPPER PERENNIAL.*** This subsystem is characterized by channels in which the gradient is high (compared to the Lower Perennial Subsystem), velocity of the water is fast, and very little floodplain development exists. There is no tidal influence and some water flows throughout the year. The substrate consists of rock, cobbles, or gravel with occasional patches of sand. The natural dissolved oxygen concentration is normally near saturation. The fauna is characteristic of running water, and there are few or no planktonic forms.
        - ***FL: Class FLATS*.** This class is characterized by exposed sand or mud at low tide or low water stages and is not vegetated.
            - ***Y: Water Regime Modifier SATURATED ON A SEMI-PERMANENT OR SEASONAL BASIS*.** This modifier refers to areas in which surface water persists throughout the growing season or for extended periods in most years. When surface water is absent, the water table is usually at or very near the land surface.
        - ***US: Class UNCONSOLIDATED SHORE.*** The Class Unconsolidated Shore includes all wetland habitats having three characteristics: (1) unconsolidated substrates with less than 75 percent areal cover of stones, boulders, or bedrock; (2) less than 30 percent areal cover of vegetation other than pioneering plants; and (3) any of the following water regimes: irregularly exposed, regularly flooded, irregularly flooded, seasonally flooded, temporarily flooded, intermittently flooded, saturated, or artificially flooded. Unconsolidated Shores are characterized by substrates lacking vegetation except for pioneering plants that become established during brief periods when growing conditions are favorable. Erosion and deposition by waves and currents produce a number of landforms such as beaches, bars, and flats, all of which are included in this Class. Unconsolidated Shores are found adjacent to Unconsolidated Bottoms in all Systems; in the Palustrine and Lacustrine Systems, the Class may occupy the entire basin. As in Unconsolidated Bottoms, the particle size of the substrate and the water regime are the important factors determining the types of plant and animal communities present
            - ***K: Water Regime Modifier ARTIFICIALLY FLOODED*.** This modifier refers to inundated areas in which the amount and duration of flooding is controlled by means of pumps or siphons in combination with dikes or dams. Neither wetlands resulting from leakage from man-made impoundments, nor irrigated pasture lands supplied by diversion ditches or artesian wells, are included under this modifier

The description for codes PEMY, PFOY, and PSSW is as follows:

- ***P: System PALUSTRINE.*** The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 part per trillion (ppt). Wetlands lacking (such vegetation) are also included if they exhibit all of the following characteristics: (1) are less than 8 hectares (20 acres); (2) do not have an active wave-formed or bedrock shoreline feature; (3) have at low water a depth of less than 6.6 feet in the deepest part of the basin; and (4) have salinity due to ocean-derived salts of less than 0.5 ppt.
  - ***EM: Class EMERGENT.*** This Class is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. The vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.
  - ***FO: Class FORESTED.*** This Class is characterized by woody vegetation that is 6 meters (20 feet) tall or taller.
    - ***Y: Water Regime Modifier SATURATED ON A SEMI-PERMANENT OR SEASONAL BASIS*.** This modifier refers to areas in which surface water persists throughout the growing season or for extended periods in most years. When surface water is absent, the water table is usually at or very near the land surface.
  - ***SS: Class SCRUB-SHRUB.*** This Class is dominated by woody vegetation less than 6 meters (20 feet) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions.
    - ***W: Water Regime Modifier INTERMITTENTLY FLOODED.*** This modifier refers to areas in which the substrate is usually exposed, but surface water is present for variable periods without detectable seasonal periodicity. Weeks, months, or even years may intervene between periods of inundation. The dominant plant communities under this regime may change as soil moisture conditions change. Some areas exhibiting this regime do not meet the characteristics of a wetland because they do not have hydric soils or support hydrophytes.

2.5 JURISDICTIONAL DELINEATION

In September 2008, the USACE issued the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region. This regional supplement is designed for use with the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987). Both the 1987 Wetlands Manual and the Arid West Supplement to the manual provide technical methods and guidelines for determining the presence of “waters of the U.S.” and wetland resources. A three-parameter approach is used to identify wetlands and requires evidence of wetland hydrology, hydrophytic vegetation, and hydric soils. Wetlands generally include swamps, marshes, bogs, and similar areas. In order to be considered a wetland, an area must exhibit at least minimal hydric characteristics within the three parameters. However, problem areas may periodically or permanently lack certain indicators due to seasonal or annual variability of the nature of the soils or plant species on site. Atypical wetlands lack certain indicators due to recent human activities or natural events. Guidance for determining the presence of wetlands in these situations is presented in the regional supplement. Non-wetland “waters of the U.S.” are delineated based on the limits of the OHWM, which can be determined by a number of factors including erosion, the deposition of vegetation or debris, and changes in vegetation.

It should be noted that the RWQCB shares USACE jurisdiction unless isolated conditions are present. If isolated waters conditions are present, the RWQCB takes jurisdiction using the USACE's definition of the OHWM and/or the three-parameter wetlands methodology pursuant to the 1987 Wetlands Manual. The CDFW's jurisdiction is defined as the top of the bank to the top of the bank of the stream, channel, or basin or to the outer limit of riparian vegetation located within or immediately adjacent to the river, stream, creek, pond, or lake or other impoundment, whichever is greater.

The analysis contained in this report uses the results of a field survey conducted by BonTerra Consulting Associate Principal/Regulatory Services Gary Medeiros and BonTerra Consulting Restoration Ecologist/Regulatory Technician David Hughes on September 28 and October 27, 2011. Photographs of the project site are included in Attachment D. The field survey included the collection of vegetation, soils, and hydrologic data from 12 sampling points on the project site. This information was recorded on a 1 inch equals 200 feet (1″ = 200′) scale aerial photograph and on Wetland Determination Data Forms (Attachment A).

SECTION 3.0 RESULTS

Twelve sampling points were assessed within drainage features within the project site. This included four sample points within Big Tujunga Reservoir, four sample points within Big Tujunga Canyon Creek downstream of Big Tujunga Dam, and four sample points within Maple Canyon SPS. The results of collected data are summarized in Table 1.

3.1 VEGETATION

The following vegetation types were observed during botanical surveys in 2011 (BonTerra Consulting 2011c): coastal sage scrub, chaparral (with chamise chaparral, scrub oak chaparral, and mixed chaparral subassociations), California annual grassland, disturbed freshwater seep, riparian herb, willow riparian scrub, willow riparian forest, white alder – Fremont cottonwood – willow riparian forest, California sycamore woodland, coast live oak stands, bigcone Douglas-fir – canyon live oak woodland (forest), open water, streambed, cliff, and developed.

The most common vegetation types within Big Tujunga Reservoir include willow riparian scrub, riparian herb, California annual grassland, and open water. The canyon sides adjacent to the reservoir are vegetated by mixed chaparral; unvegetated cliff faces are also located in these areas. Downstream of Big Tujunga Dam, the most common vegetation types are willow riparian forest, coast live oak stands, disturbed freshwater seeps, and ornamental. The Maple Canyon SPS consists of chamise chaparral, scrub oak chaparral, mixed chaparral, California annual grassland, and coast live oak stands.

Two listed species were observed during focused biological surveys performed by BonTerra Consulting in 2011: the arroyo toad, a federally Endangered species (BonTerra Consulting 2011a), and the Santa Ana sucker, a federally Threatened species (BonTerra Consulting 2011b). A single arroyo toad was observed at the extreme upstream end of Big Tujunga Reservoir, and Santa Ana sucker was observed in Big Tujunga Canyon Creek downstream of Big Tujunga Dam. Other special status wildlife species that have been observed within the project boundary include western pond turtle (*Emys marmorata*), peregrine falcon (*Falco peregrinus*), arroyo chub (*Gila orcuttii*), Santa Ana speckled dace (*Rhinichthys osculus* ssp. *3*), and two-striped garter snake (*Thamnophis hammondii*). Special status plants observed within the project boundary include Plummer's mariposa lily (*Calochortus plummerae*), fragrant pitcher plant (*Lepechinia fragrans*), San Gabriel oak (*Quercus durata* var. *gabrielensis*), and Greata's aster (*Symphyotrichum greatae*).

The hydrophytic vegetation criterion was met at sampling points 1 through 8. Vegetation associated with sampling points 1 through 4 (Big Tujunga Reservoir) was characterized by sparse willow riparian scrub and riparian herb vegetation species (see Table 1). Vegetation downstream of Big Tujunga Dam (sampling points 5 through 8) consists of willow trees as well as various riparian herbaceous species. Vegetation associated with sampling points 9 through 12 (Maple Canyon SPS) consists of native and non-native upland shrubs. Therefore, the hydrophytic vegetation criterion was not met for sampling points 9 through 12.

TABLE 1
SUMMARY OF HYDROPHYTIC VEGETATION, HYDRIC SOILS, AND WETLANDS HYDROLOGY WETLANDS INDICATOR STATUS BY SOIL TEST PIT LOCATION

Soil Test Pit	Location	Plant species	Common Name	Absolute Percent Cover	Wetland Indicator Status[a]	Passed Dominance Test	Passed Prevalence Index	Meets Hydrophytic Vegetation Criterion	Meets Hydric Soils Criterion	Meets Wetlands Hydrology Criterion
1	Big Tujunga Reservoir	*Salix lasiolepis*	arroyo willow	15	OBL	Yes	Yes	Yes	No	Yes
		Salix exigua	sandbar willow	10	OBL					
		Xanthium strumarium	cocklebur	5	FAC					
		Baccharis salicifolia	mule fat	5	FACW					
		Mimulus pilosus	downy monkeyflower	40	OBL					
		Persicaria lapathifolia	willow weed	5	OBL					
2	Big Tujunga Reservoir	*Sisymbrium orientale*	hare's ear cabbage	2	FACU	Yes	Yes	Yes	No	Yes
		Mimulus cardinalis	scarlet monkeyflower	2	OBL					
		Ambrosia psilostachya	western ragweed	2	FAC					
3	Big Tujunga Reservoir	*Salix gooddingii*	Goodding's black willow	2	OBL	Yes	Yes	Yes	No	Yes
4	Big Tujunga Reservoir	*Typha* sp.	cattail	1	OBL	Yes	Yes	Yes	Yes	Yes
		Chamaesyce maculata	spotted spurge	1	FAC					
5	Big Tujunga Wash[b]	*Persicaria lapathifolia*	willow weed	5	OBL	Yes	Yes	Yes	No	Yes
6	Big Tujunga Wash[b]	*Alnus rhombifolia*	white alder	15	FACW	Yes	Yes	Yes	No	Yes
		Salix lasiolepis	arroyo willow	10	OBL					
		Nicotiana glauca	tree tobacco	5	FAC					
		Salvia mellifera	black sage	20	UPL					
		Acmispon glaber	deerweed	10	UPL					
		Erigeron canadensis	common horseweed	5	FAC					
		Xanthium strumarium	cocklebur	20	FAC					
		Veronica anagalis-aquatica	water speedwell	20	OBL					
7	Big Tujunga Wash[b]	*Salix lasiolepis*	arroyo Willow	80	OBL	Yes	Yes	Yes	Yes	Yes
		Typha sp.	cattail	20	OBL					
		Persicaria lapathifolia	willow weed	15	OBL					
		Ageratina adenophora	crofton weed	5	NI					
		Rorippa nasturtium-aquaticum	water cress	5	OBL					
		Mimulus cardinalis	scarlet monkeyflower	5	OBL					
		Xanthium strumarium	cocklebur	1	FAC					

TABLE 1 (Continued)
SUMMARY OF HYDROPHYTIC VEGETATION, HYDRIC SOILS, AND WETLANDS HYDROLOGY WETLANDS INDICATOR STATUS BY SOIL TEST PIT LOCATION

Soil Test Pit	Location	Plant species	Common Name	Absolute Percent Cover	Wetland Indicator Status[a]	Passed Dominance Test	Passed Prevalence Index	Meets Hydrophytic Vegetation Criterion	Meets Hydric Soils Criterion	Meets Wetlands Hydrology Criterion
8	Big Tujunga Wash[b]	*Salix lasiolepis*	arroyo willow	40	OBL	Yes	Yes	Yes	Yes	Yes
		Populus fremontii	Fremont's cottonwood	10	FACW					
		Typha sp.	cattail	10	OBL					
		Persicaria lapathifolia	willow weed	5	OBL					
		Cyperus eragrostis	tall umbrella sedge	2	OBL					
		Polypogon monspeliensis	rabbitsfoot grass	2	FACW					
9	Maple Canyon SPS	*Mimulus cardinalis*	scarlet monkeyflower	5	OBL	No	No	No	No	Yes
		Salix lasiolepis	arroyo willow	5	OBL					
		Melilotus alba	white sweetclover	25	FACU					
		Medicago polymorpha	bur clover	25	UPL					
		Veronica anagalis-aquatica	water speedwell	10	OBL					
		Rumex crispus	curly dock	10	FACW					
		Ambrosia psilostachya	western ragweed	5	FAC					
10	Maple Canyon SPS	*Salsola tragus*	russian thistle	60	UPL	No	No	No	No	Yes
		Brassica nigra	black mustard	40	UPL					
		Ambrosia acanthicarpa	annual bur-sage	30	UPL					
11	Maple Canyon SPS	*Brassica nigra*	black mustard	80	UPL	No	No	No	No	Yes
		Ambrosia acanthicarpa	annual bur-sage	20	UPL					
		Bromus madritensis ssp. *rubens*	foxtail chess	10	UPL					
		Melilotus alba	white sweetclover	5	FACU					
12	Maple Canyon SPS	*Brassica nigra*	black mustard	30	UPL	No	No	No	No	Yes
		Ambrosia acanthicarpa	annual bur-sage	30	UPL					
		Salsola tragus	Russian thistle	10	UPL					

SPS: Sediment Placement Site

Note: A positive (+) or negative (-) sign is used with the wetland indicator categories to more specifically define the regional frequency of a species' occurrence in wetlands.

[a] FACW: facultative wetland; FAC: facultative; UPL: obligate upland; OBL: obligate wetland; FACU: facultative upland; NI: no indicator (i.e., insufficient information available to determine an indicator status).

[b] Big Tujunga Wash refers to areas downstream of Big Tujunga Dam

3.2 SOILS

Soils within Big Tujunga Reservoir (Sampling Points 1 through 4) are generally coarse sand, though Sample Point 4 consists of clayey-silt. A hydric soil indicator was observed at Sampling Point 4.

Soils downstream of Big Tujunga Dam (Sampling Points 5 through 8) generally consist of clayey-silt or silty clay, sometimes under a thin layer of gravel. Soil is very thin at Sampling Points 7 and 8, but due to the perennial nature of the stream combined with obligate wetland vegetation (e.g., cattails, willows) the presence of hydric soil conditions was inferred.

Soils within the Maple Canyon SPS (Sampling Points 9 though 12) are all dominated by sand, none of which contain wetland soil indicators.

3.3 HYDROLOGY

The project site is within the 834-square-mile Los Angeles River Watershed. Big Tujunga Canyon Creek (Hydrologic Unit Code 180701050103) flows into Big Tujunga Reservoir. Water that is discharged through Big Tujunga Dam flows into Big Tujunga Wash and travels approximately 14 miles before it reaches the Hansen Flood Control Basin. Water that is discharged through Hansen Dam travels through the concrete-lined Tujunga Wash until flowing into the Los Angeles River and ultimately the Pacific Ocean in the City of Long Beach.

All sampling points exhibit indicators of wetland hydrology. Sampling Points 1 through 9 exhibit one or more primary indicators of wetland hydrology (surface water, high water table, and/or saturated soil), while Sampling Points 10 through 12 exhibit two secondary indicators of wetland hydrology (sediment deposits and drainage patterns).

SECTION 4.0 JURISDICTIONAL DELINEATION

4.1 U.S. ARMY CORPS OF ENGINEERS DETERMINATION

"Waters of the U.S." (Non-Wetland) Determination. Big Tujunga Canyon Creek flows into Big Tujunga Reservoir. Water released through Big Tujunga Dam flows into Big Tujunga Wash, which reaches Hansen Flood Control Basin. Flows that are discharged through Hansen Dam travel through Tujunga Wash, which conveys flows to the Los Angeles River, which ultimately flows into the Pacific Ocean in the City of Long Beach. The project site is approximately 62 river miles and 37 aerial miles from the Pacific Ocean.

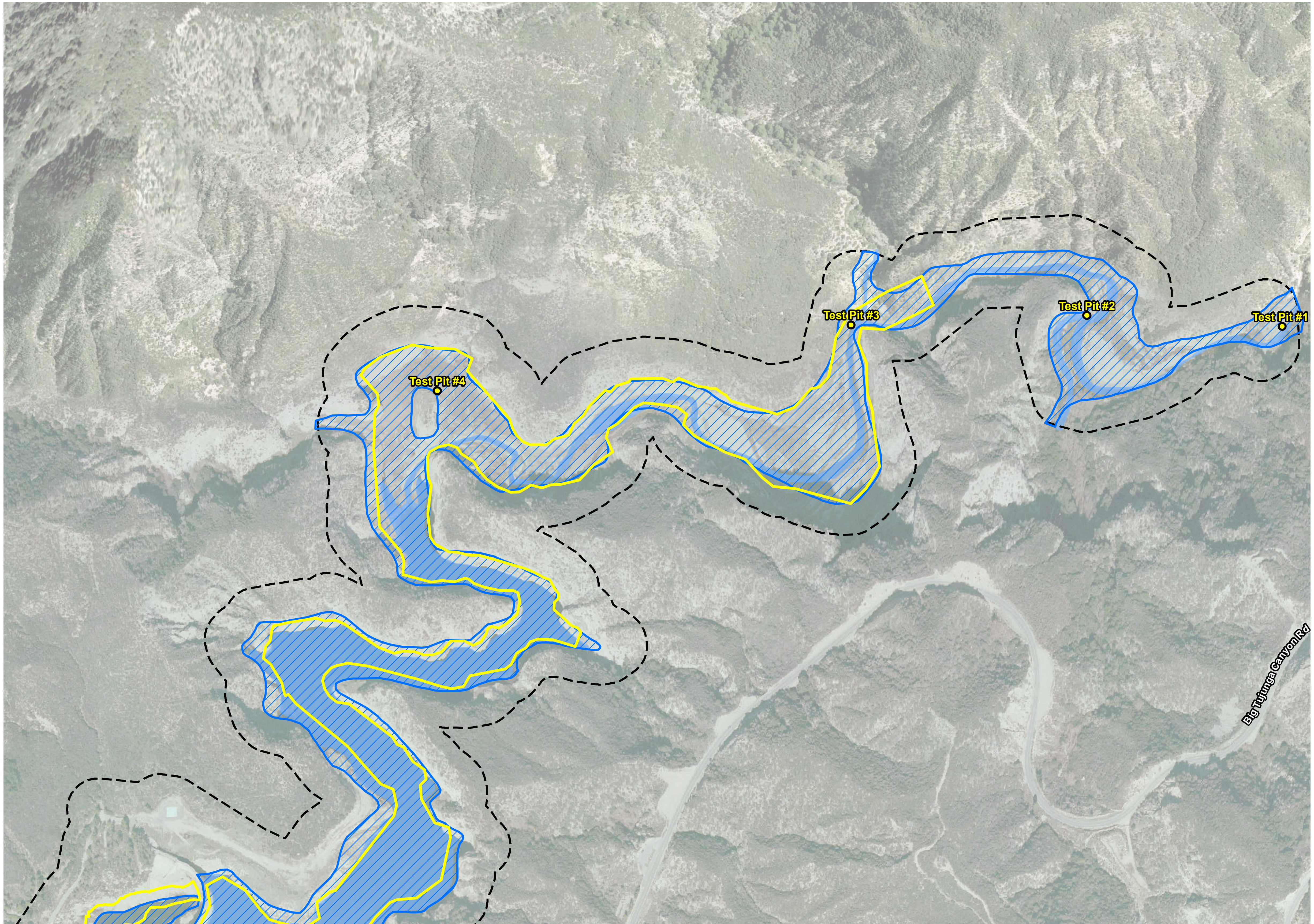
The NWI describes Big Tujunga Canyon Creek upstream of Big Tujunga Reservoir as a perennial stream. The NWI classification of Big Tujunga Wash contains the modifier of being saturated on a semi-permanent or seasonal basis. These classifications are consistent with field observations during the jurisdictional delineation. Therefore both these portions of the project site satisfy the USACE criteria for Relatively Permanent Waters (RPW). The Los Angeles River and Pacific Ocean are designated as Traditional Navigable Waters (TNW) by the USACE. As a result, Big Tujunga Canyon Creek, Big Tujunga Reservoir, and Big Tujunga Wash all fall within the USACE's jurisdiction, as described in the Supreme Court's *Rapanos* decision.

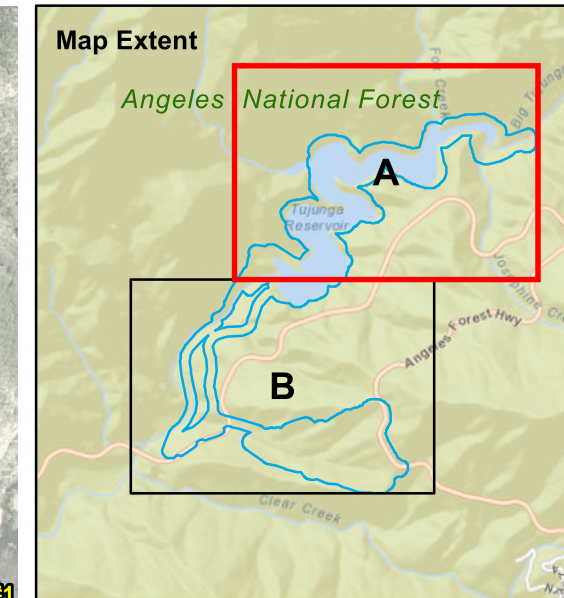
The drainages mapped within the upper portion of the Maple Canyon SPS are not described by the NWI. These drainages do not appear to contain seasonal flows and would not be considered to be RPW. However, these drainage features appear to drain eventually into Big Tujunga Wash, meaning they have a "significant nexus" with a TNW, as described in the *Rapanos* decision. As a result, the USACE may assert jurisdiction over these drainages.

The limits of the "waters of the U.S." on the project site were defined by the presence of the OHWM, which were observed as drainage patterns, surface water, saturation, and drift deposits within the drainage features within the project site. Based on the field observations and data collected, approximately 76.88 acres of non-wetland "waters of the U.S." occur within the project site. This consists of 67.43 acres within Big Tujunga Reservoir, 1.72 acre within Maple Canyon SPS, 1.51 acre within the plunge pool immediately downstream of Big Tujunga Dam, and 6.22 acres within Big Tujunga Wash to the Big Tujunga Canyon Road overpass. The extent of "waters of the U.S." on the project site is shown on Exhibits 5A through 5B.

Based on the currently proposed limits of disturbance, approximately 43.20 acres of non-wetland "waters of the U.S." would be temporarily impacted by the removal of excess sediment within Big Tujunga Reservoir and 1.27 acre would be temporarily impacted for sediment removal within the plunge pool below the dam. Approximately 1.03 acre would be permanently impacted within Maple Canyon SPS as sediment from the reservoir is deposited in the SPS, which would fill the drainage features in the upper portion of the SPS. A summary of the quantity of "waters of the U.S." that are located on the project and that are within the proposed impact boundary is provided in Table 2.

Wetlands Determination. As previously described in Section 2.0 of this report, an area must exhibit all three wetland parameters, as described in the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* and the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) in order to be considered a jurisdictional wetland. Wetland hydrology and hydrophytic vegetation are present throughout sampling points within Big Tujunga Canyon Creek, Big Tujunga Reservoir, and Big Tujunga Wash. However, all three parameters were observed at Sampling Point 4 (within Big Tujunga Reservoir) and Sampling Points 7 and 8 (Big Tujunga Wash). Sampling Points within the Maple Canyon SPS contain wetland hydrology characteristics only.





Project Area
Test Pit Location
Proposed Limits of Sediment Removal
Proposed Limits of Sediment Deposition
Open Water*

USACE Jurisdiction

"Waters of the U.S." (width in feet)
"Waters of the U.S." (concrete channel)
"Waters of the U.S."

*Open water boundaries observed on October 27, 2011, though variable throughout year.
Aerial Source: Aerials Express, 2009

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USACE Jurisdictional Resources

Exhibit 5A

Big Tujunga Reservoir Sediment Removal Project

N W E S

500 250 0 500 Feet

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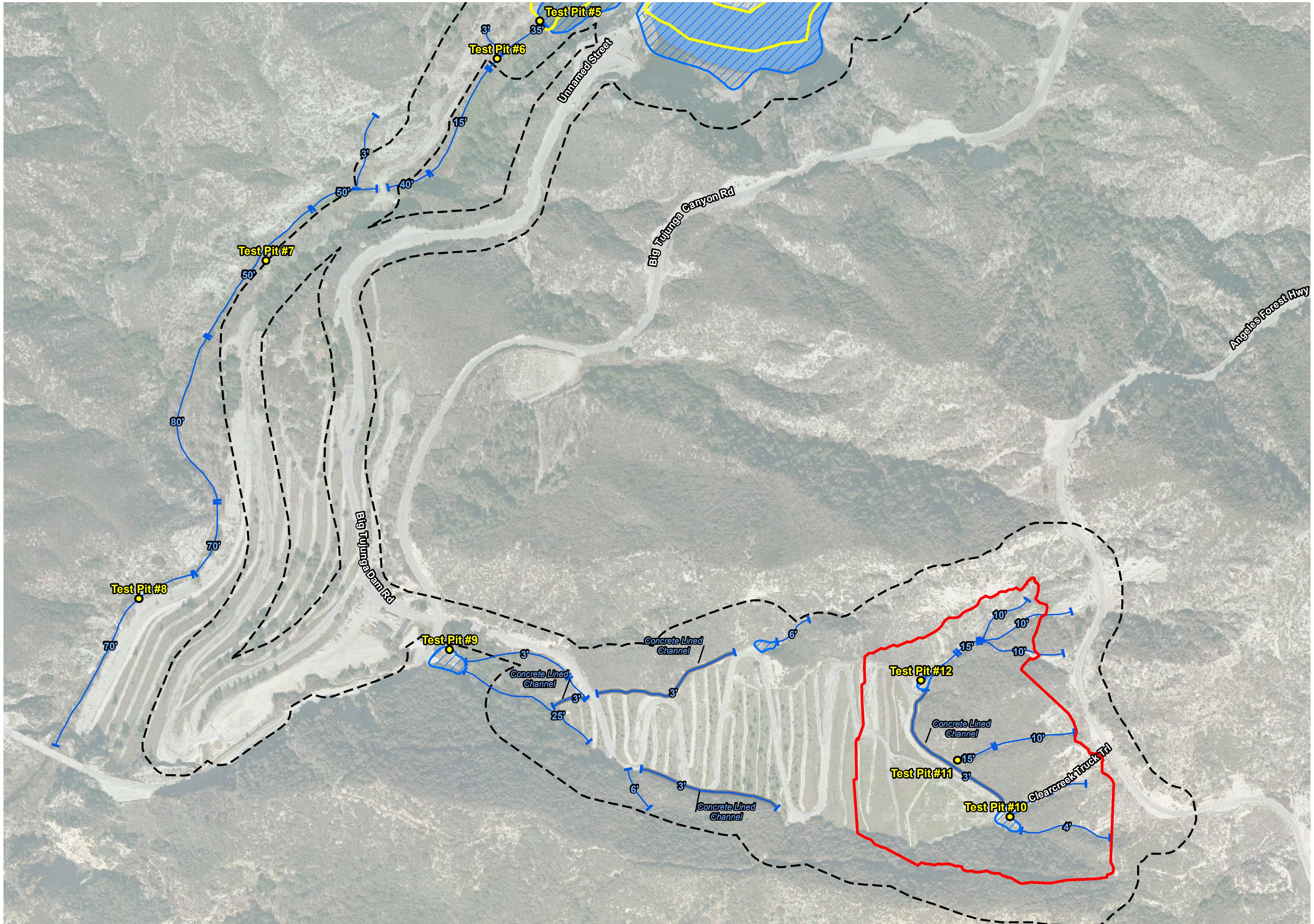

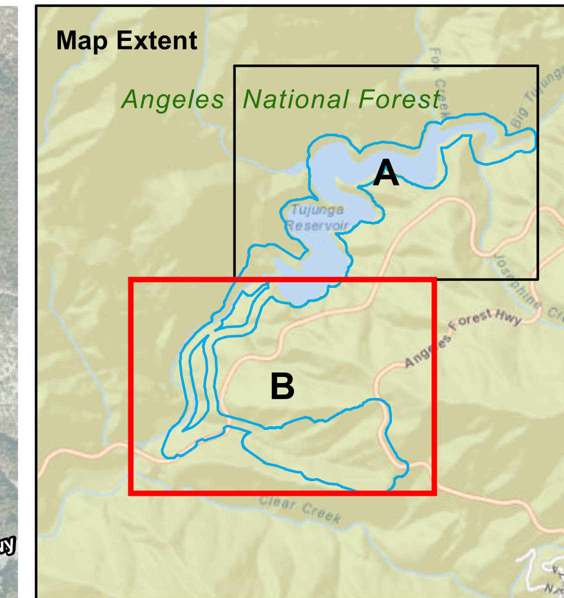

Project Area

Test Pit Location

Proposed Limits of Sediment Removal

Proposed Limits of Sediment Deposition

Open Water*

USACE Jurisdiction

"Waters of the U.S." (width in feet)

"Waters of the U.S." (concrete channel)

"Waters of the U.S."

*Open water boundaries observed on October 27, 2011, though variable throughout year.
Aerial Source: Aerials Express, 2009

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USACE Jurisdictional Resources

Exhibit 5B

Big Tujunga Reservoir Sediment Removal Project

N W E S

500 250 0 500 Feet

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Though all three parameters were observed at Sampling Points 4, 7, and 8, identification of these areas as wetlands is problematic. Sampling Point 4 contains very sparse and immature wetland vegetation, as this area is typically underwater. The project area was surveyed during the time of year when water levels are at the lowest point for access purposes. Because the presence of wetland vegetation is not expected to persist beyond a few weeks each year in this location, this location is not shown as a wetland in Exhibit 5B.

Sampling Points 7 and 8 were chosen because of the presence of obligate wetland vegetation including cattails (*Typha* sp.) and water cress (*Rorippa nasturtium-aquaticum*). However, analysis of the soil characteristics was difficult due to the presence of a restrictive layer (cobble). The presence of perennial water and wetland vegetation led to an assumption of the presence of wetland soils as well. Based on this approach, wetland conditions would exist in several small pockets extending from Sampling Point 7, downstream to the Big Tujunga Canyon Road overpass where this investigation concluded. Much of Big Tujunga Wash is outside of the survey area and no impacts are proposed in this area. Sampling Points 7 and 8 are included in the jurisdictional delineation to better characterize the overall condition of this reach. Due to the small size of the assumed wetland conditions and because this area is outside of the project survey area, the extent of wetlands in this area was not mapped.

TABLE 2
USACE JURISDICTIONAL "WATERS OF THE U.S." AND CDFW JURISDICTIONAL WATERS WITHIN THE PROJECT SITE

Project Areas	USACE non-wetland "waters of the U.S."			CDFW Jurisdictional Waters		
	Total Existing (acres)	Proposed Permanent Impact (acres)	Proposed Temporary Impact (acres)	Total Existing (acres)	Proposed Permanent Impact (acres)	Proposed Temporary Impact (acres)
Big Tujunga Reservoir	67.43	0.00	43.20	68.06	0.00	43.20
Maple Canyon Sediment Placement Site	1.72	1.03	0.00	3.79	1.76	0.00
Plunge Pool	1.51	0.00	1.27	1.97	0.00	1.40
Big Tujunga Wash[a]	6.22	0.00	0.00	12.48	0.00	0.00
Total	**76.88**	**1.03**	**44.47**	**86.30**	**1.76**	**44.60**

[a] Note that 6.14 acres of "waters of the U.S." and 12.0 acres of CDFW jurisdiction within Big Tujunga Wash that are included in this analysis are outside the survey area but were included in the delineation to provide a complete description of site conditions.

4.2 CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD DETERMINATION

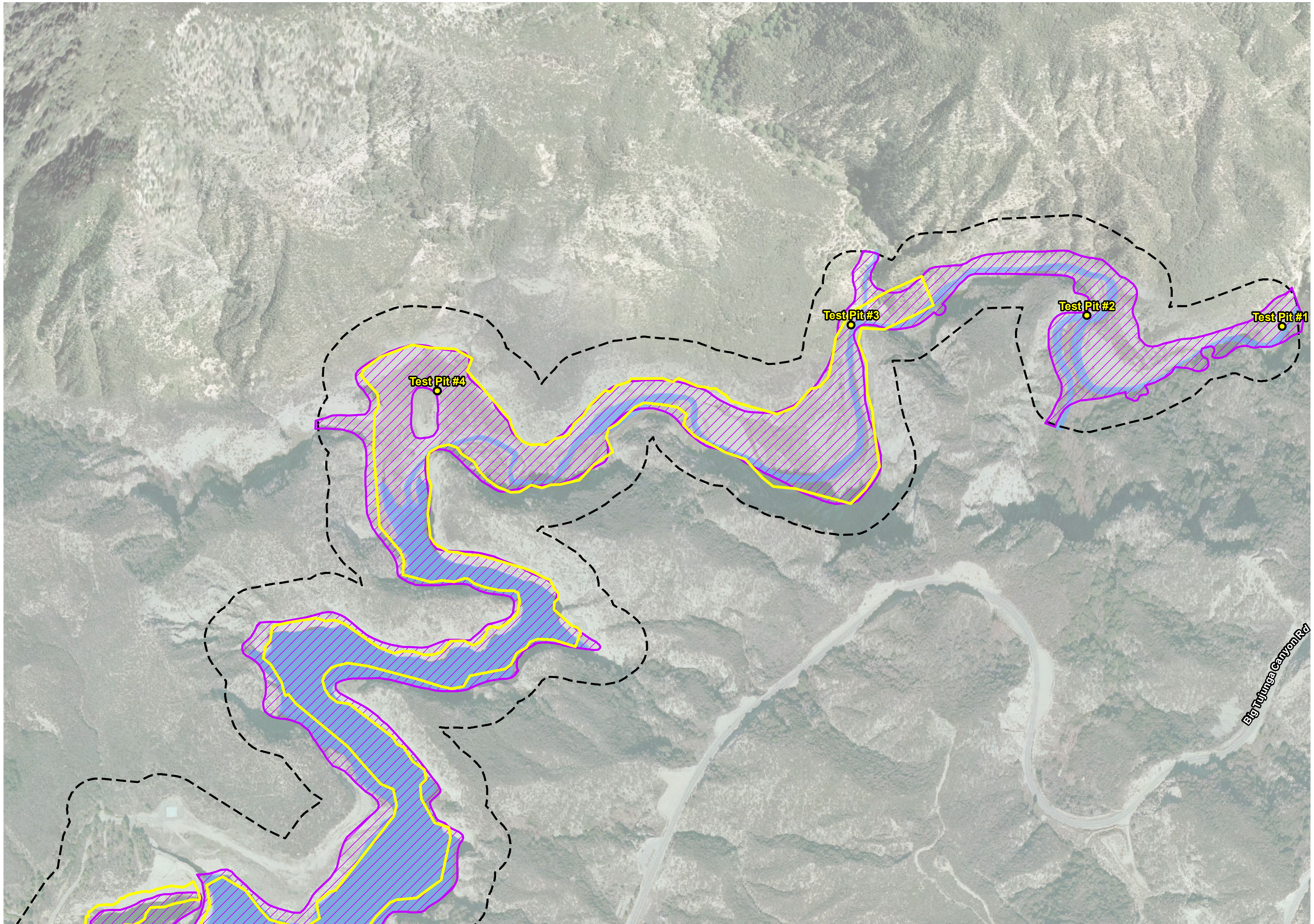
The RWQCB jurisdictional boundaries are defined as those determined for the USACE under "waters of the U.S.". However, the RWQCB takes jurisdiction over both connected and isolated waters. None of the "waters of the U.S." identified within the project survey limits would be considered isolated; therefore, the RWQCB and USACE jurisdictions are the same. Approximately 76.88 acres (including 67.43 acres within Big Tujunga Reservoir, 1.72 acres within Maple Canyon SPS, 1.51 acre within the plunge pool, and 6.22 acres within Big Tujunga Wash) would be considered "waters of the U.S." based on the presence of an OHWM and connectivity to a TNW; therefore, it would be considered jurisdictional by the RWQCB. Based on the current project limits of disturbance, approximately 44.47 acres of non-wetland "waters of the U.S." would be temporarily impacted through the removal of excess sediment within Big Tujunga Reservoir and the plunge pool. Approximately 1.03 acre would be permanently impacted within the Maple Canyon SPS. The extent of RWQCB jurisdictional areas is shown in Exhibits 5A through 5B and is summarized above in Table 2.

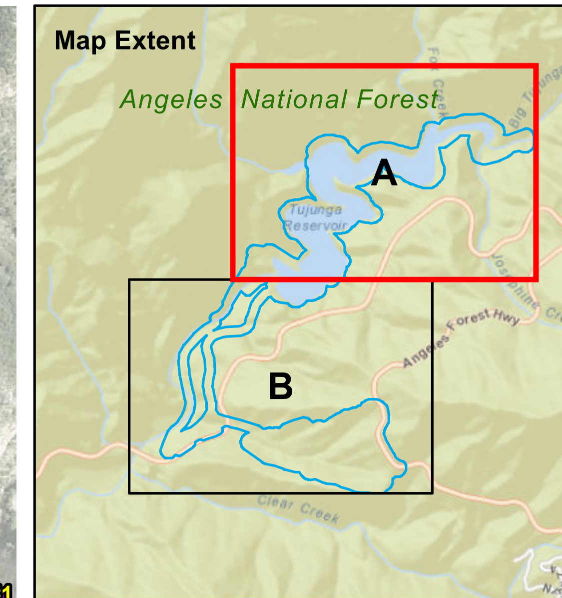
4.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE DETERMINATION

The limits of CDFW jurisdiction within the drainages extends from the top of the bank to the top of the bank and to the outer drip line in areas containing riparian vegetation. Based on field observations and data collection, a total of approximately 86.30 acres of resources under CDFW jurisdiction pursuant to Section 1602 of the *California Fish and Game Code* are located within the project site. This consists of 68.06 acres within Big Tujunga Reservoir, 3.79 acres within the Maple Canyon SPS, 1.97 acre within the plunge pool, and 12.48 acres within Big Tujunga Wash to the point where it reaches the Big Tujunga Canyon Road overpass.

Based on the currently proposed limits of disturbance, approximately 44.6 acres of CDFW jurisdictional waters would be temporarily impacted by the removal of excess sediment within Big Tujunga Reservoir and the plunge pool. Approximately 1.76 acre would be permanently impacted within the Maple Canyon SPS as sediment from the reservoir is deposited in the SPS. The extent of CDFW jurisdiction on the project site is shown on Exhibits 6A through 6B and is summarized above in Table 2.

Please note that the limits of USACE and CDFW jurisdiction are largely the same within Big Tujunga Reservoir due to the general lack of hydrophytic vegetation within the reservoir which typically causes CDFW's jurisdiction to exceed that of the USACE.





Survey Area
Test Pit Location
Proposed Limits of Sediment Removal
Proposed Limits of Sediment Deposition
Open Water*

CDFG Jurisdiction

CDFW Jurisdictional Area (width in feet)
CDFW Jurisdictional Area (concrete channel)
CDFW Jurisdictional Area

*Open water boundaries observed on October 27, 2011, though variable throughout year.
Aerial Source: Aerials Express, 2009

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CDFW Jurisdictional Resources

Exhibit 6A

Big Tujunga Reservoir Sediment Removal Project

N W E S

500 250 0 500 Feet

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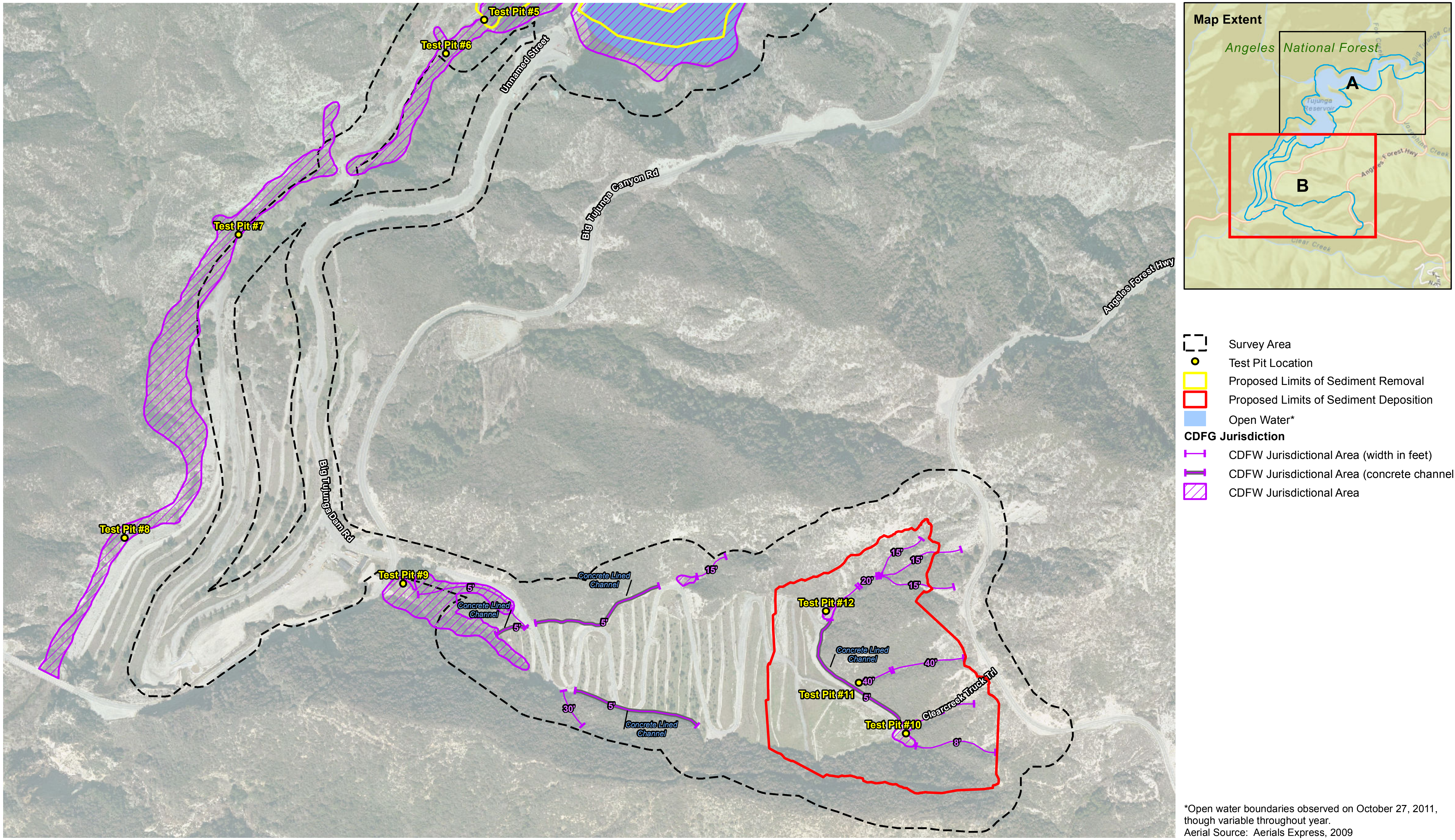

*Open water boundaries observed on October 27, 2011, though variable throughout year.
Aerial Source: Aerials Express, 2009

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CDFW Jurisdictional Resources

Exhibit 6B

Big Tujunga Reservoir Sediment Removal Project

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SECTION 5.0 CONCLUSION OF REGULATORY APPROVAL PROCESS

5.1 REGULATORY PERMIT REQUIREMENTS

The following is a general summary of the various permits, agreements, and certifications required prior to initiation of project activities that involve impacts to areas under the jurisdiction of the USACE, the RWQCB, and the CDFW.

- USACE Section 404 Permit;
- RWQCB Section 401 Water Quality Certification; and
- CDFW Section 1602 Streambed Alteration Agreement.

Please note that although impacts to the federally listed Endangered arroyo toad observed at the upstream end of Big Tujunga Reservoir and the federally Threatened Santa Ana sucker observed downstream of Big Tujunga Dam are not expected to be affected by the proposed project activities, the USACE may elect to consult with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Federal Endangered Species Act. The USFWS would then determine if the project may affect these species and issue a biological opinion (BO) to the USACE. The BO would then need be issued before the USACE would issue a Section 404 Permit.

It should also be noted that the USACE and the RWQCB applications can be processed concurrently. The USACE permit would be issued subject to the receipt of the RWQCB's Section 401 Water Quality Certification. There is no filing fee for the Section 404 Permit. The Section 401 Water Quality Certification filing fee has a $944 base fee (as of November 2011) with additional fees based on the size of the dredge or fill unless the project qualifies for a flat fee. For low impact discharges (e.g., discharge of less than 0.1 acre, 200 linear feet, and 25 cubic yards), there is no charge above the base fee. For fill and excavation discharges, the filing fee is based on a rate of $4,059 per acre of discharge or excavation. For projects that propose to discharge fill into channels (as is proposed for drainages within Maple Canyon SPS) the fee must be calculated based on a rate of $4,059 per acre of impact and $9.44 per linear foot of impact. The higher of the two calculations is charged for the permit fee.

The CDFW's Streambed Alteration Agreement filing fee is based on project cost and length of permit authorization (i.e., maintenance permit for greater than five years). For projects lasting five years or less, the maximum fee is $4,482.75 (as of January 1, 2010) for projects costing $500,000 or more; the fee decreases as cost decreases. For projects lasting longer than five years, there is a base fee of $2,689.50 plus a maximum of $4,482.75. The CDFW application submittal will not be deemed complete until the application fees have been paid and the agency is provided with a certified California Environmental Quality Act (CEQA) document and a signed copy of the receipt of County Clerk filing fees for the Notice of Determination (NOD). In addition, land use jurisdictions can no longer make "de minimis" findings if they determine that the project will not impact resources under the CDFW's jurisdiction. Therefore, the finding of "No Impact" or "No Substantial Effect" to the CDFW jurisdictional resources must now be made by the CDFW prior to the payment of CDFW fees.

A detailed explanation of the regulatory permitting requirements for impacts to jurisdictional resources is provided in Sections 5.2 through 5.4.

5.2 U.S. ARMY CORPS OF ENGINEERS

Regulatory authorization in the form of an NWP is provided for certain categories of activities (e.g., repair, rehabilitation, or replacement of a structure or fill which was previously authorized; utility line placement; bank stabilization). These permits are valid only if the conditions applicable to the permits are met. The sediment removal portion of the proposed project would likely qualify for an NWP (either NWP 3 [Maintenance] or NWP 31 [Maintenance of Existing Flood Control Facilities]), but the amount of fill that is proposed for deposition within the Maple Canyon SPS would exceed the threshold for an NWP 18 (Minor Discharges). The Los Angeles District USACE District Engineer could consider a waiver since the Maple Canyon drainages are ephemeral in nature. If the conditions cannot be met or if the District Engineer does not approve a waiver that would allow impacts to these resources to be authorized under NWP 18, an Individual Permit (IP) will be required. “Waters of the U.S.” that are temporarily filled, flooded, excavated, or drained but restored to pre-construction contours and elevations after construction are not included in the measurement of loss of “waters of the U.S.”. The appropriate permit authorization will be based on the amount of impacts to “waters of the U.S.”, as determined by the USACE. Please note that the current NWP program is expiring on March 18, 2012, and a new set of NWPs are expected to become effective on that date.

5.2.1 JURISDICTIONAL DETERMINATIONS

Pursuant to USACE Regulatory Guidance Letter (RGL) 08-02 (dated June 26, 2008), the USACE can issue two types of jurisdictional determinations to implement Section 404 of the CWA: Approved Jurisdictional Determinations and Preliminary Jurisdictional Determinations (USACE 2008a). An Approved Jurisdictional Determinations is an official USACE determination that jurisdictional “waters of the U.S.”, “Navigable waters of the U.S.”, or both are either present or absent on a site. An Approved Jurisdictional Determinations also identifies the precise limits of jurisdictional waters within a project site.

The USACE will provide an Approved Jurisdictional Determination when (1) an applicant requests an official jurisdictional determination; (2) an applicant contests jurisdiction over a particular water body or wetland; or (3) when the USACE determines that jurisdiction does not exist over a particular water body or wetland. The Approved Jurisdictional Determination then becomes the USACE’s official determination that can then be relied upon over a five-year period to request regulatory authorization as part of the permit application process.

In addition, an Applicant may decline to request an Approved Jurisdictional Determination and instead obtain a USACE IP or General Permit Authorization based on a Preliminary Jurisdictional Determination or, in certain circumstances (e.g., authorizations by non-reporting nationwide general permits), with no Jurisdictional Determination.

Preliminary Jurisdictional Determinations are non-binding, advisory in nature, and may not be appealed. They indicate that there may be “waters of the U.S.” on a project site. An applicant may elect to use a Preliminary Jurisdictional Determination to voluntarily waive or set aside questions regarding CWA jurisdiction over a site, usually in the interest of allowing the applicant to move ahead expeditiously with the permitting process. The USACE will determine what form of Jurisdictional Determination is appropriate for a particular project site. Given the type and extent of project impacts and duration of construction, the USACE will likely approve the Jurisdictional Delineation Report through a Preliminary Jurisdictional Determination.

On January 31, 2007, the USACE published a memorandum clarifying the Interim Guidance for amendments to the National Historic Preservation Act and the Advisory Council on Historic Preservation (ACHP) implementing regulations (USACE 2007). The Interim Guidance applies to all Department of the Army requests for authorization/verification, including Individual Permits (standard permits and letters of permission) and all Regional General Permits (RGPs) and NWPs. The State or Tribal Historic Preservation Officer (SHPO/THPO) has 30 days to respond to a determination that a proposed activity, that otherwise qualifies for an NWP or RGP, has no effect or no adverse effect on a historic property. If the SHPO/THPO does not respond within 30 days of notification, the Los Angeles District may proceed with verification. If the SHPO/THPO disagrees with the District's determination, the District may work with the SHPO/THPO to resolve the disagreement or request an opinion from the ACHP. The USACE will submit the Draft Jurisdictional Delineation Report to the SHPO/THPO for review prior to initiating the actual regulatory process.

The USACE Regulatory Branch Offices will coordinate with the USEPA Regional Office and USACE Headquarters (HQ), as outlined in its January 28, 2008, memorandum entitled the *Process for Coordinating Jurisdictional Delineations Conducted Pursuant to Section 404 of the Clean Water Act in Light of the Rapanos and SWANCC Supreme Court Decisions* (USACE 2008b). The guidance provided in this memorandum is quoted as follows:

1. Effective immediately, unless and until paragraph 5(b) of the June 5, 2007, Rapanos guidance coordination memorandum is modified by a joint memorandum from Army and EPA, we will follow these procedures:
   a. For jurisdictional determinations involving significant nexus determinations, USACE districts will send copies of draft jurisdictional delineations via e-mail to appropriate EPA regional offices. The EPA regional office will have 15 calendar days to decide whether to take the draft jurisdictional delineation as a special case under the January 19, 1989, "Memorandum of Agreement Between the Department of the Army and the USEPA Concerning the Determination of the Section 404 Program and the Application of the Exceptions under Section 404(f) of the Clean Water Act." If the EPA regional office does not respond to the district within 15 days, the district will finalize the jurisdictional determination.
   b. For jurisdictional determinations involving isolated waters determinations, the agencies will continue to follow the procedure in paragraph 5(b) of June 5, 2007, coordination memorandum, until a new coordination memorandum is signed by USACE and EPA. (In accordance with paragraph 6 of the June 5, 2007, coordination memorandum, this is a 21-day timeline that can only be changed through a joint memorandum between agencies).
2. Approved JDs are not required for non-reporting NWPs, unless the project proponent specifically requests an approved JD. For proposed activities that may qualify for authorization under a State Programmatic General Permit (SPGP) or RGP, an approved JD is not required unless requested by the project proponent.
3. The USACE will continue to work with EPA to resolve the JDs involving significant nexus and isolated waters determinations that are currently in the elevation process.
4. USACE districts will continue posting completed Approved JD Forms on their web pages.

Please note that if the USACE determines that the drainage is jurisdictional and would be impacted by project implementation, the Applicant will be required to obtain a CWA Section 401 Water Quality Certification from the RWQCB before the USACE will issue the Section 404 permit. That is, the USACE may issue a "Denial Without Prejudice" as part of the issuance of the Section 404 permit that makes the permit valid once the Section 401 Water Quality Certification is issued. If the USACE determines that the impacted drainage is not jurisdictional, the Applicant will be required to obtain RWQCB authorization under the provisions of a Report of Waste Discharge (ROWD).

Please also note that the USACE has prepared Draft Guidelines on Identifying Waters Protected by the Clean Water Act (Act) to implement the U.S. Supreme Court's decisions concerning the extent of waters covered by the Act (Solid Waste Agency of Northern Cook County v. USACE [SWANCC] and Rapanos v. United States [Rapanos]). The review period for the draft guidelines ended in June 2011, and the USEPA is expected to issue a rule for public review in 2012. The U.S. Environmental Protection Agency and the USACE will now consider comments received on the draft guidelines; make revisions where appropriate; and finalize and undertake rulemaking consistent with the Administrative Procedure Act. The result will be a "nonbinding guidance" for the identification of resources under the jurisdiction of the USACE. The final guidance will not affect jurisdictional delineations that have already received approval from the USACE.

5.3 REGIONAL WATER QUALITY CONTROL BOARD

As noted above, issuance of the USACE Section 404 permit would be contingent upon the approval of a Section 401 Water Quality Certification from the Los Angeles RWQCB. Also, the RWQCB requires certification of the project's CEQA documentation before it will approve the Section 401 Water Quality Certification or ROWD. The RWQCB, as a responsible agency, will use the project's CEQA document to satisfy its own CEQA-compliance requirements.

Upon acceptance of a complete permit application, the RWQCB has between 60 days and 1 year to make a decision regarding the permit request. That is, USACE regulations indicate that the RWQCB has 60 days from the date of receipt of a completed application that requests water quality certification to make a decision (33 CFR §325.2[b][1][ii]). The USACE District Engineer may specify a longer time (up to one year) or shorter time based on his/her determination of a reasonable processing time (33 CFR §325.2[b][1][ii]). If the RWQCB determines that more than 60 days are needed to process the request, it has the option of requesting additional time from the USACE. Also, the RWQCB has the option of issuing a "Denial Without Prejudice", which does not mean that the request is denied, but that it requires more information in order to make a decision. This effectively stops the processing clock until this information is provided.

The RWQCB is required under the *California Code of Regulations* (CCR) (Title 23, §3858[a]) to have a "minimum 21 day public comment period" before any action can be taken on the Section 401 application. This period closes when the RWQCB acts on the application. Since projects often change or are revised during the Section 401 permit process, the comment period can remain open. The public comment period starts as soon as an application has been received. Although the RWQCB Section 401, USACE Section 404, and CDFW Section 1602 permit applications are submitted at the same time as a permit application package, the RWQCB Section 401 Water Quality Certification may take longer to process.

The RWQCB requires the Applicant to address urban storm water runoff during and after construction in the form of Best Management Practices (BMPs). These BMPs are intended to address the treatment of pollutants carried by storm water runoff and are required for an application to be deemed complete. Also, the RWQCB requires that the Applicant address the policies contained in the Basin Plan (i.e., compliance with water quality objectives and protection of Beneficial Uses). Please note that the application would also require the payment of a Section 401 Application Fee, which would be based on project impacts.

5.4 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

The CDFW regulates all work (including initial construction and ongoing operation and maintenance) that may substantially divert or obstruct the natural flow of or substantially change or use any material from the bed, channel, or bank of any river, stream, or lake through its Streambed Alteration Program. An Applicant must enter into an agreement with the CDFW to ensure no net loss of wetland values and acreages.

Impacts resulting from Project implementation will require a Section 1602 Streambed Alteration Agreement. The Streambed Alteration Agreement must address the initial construction and long-term operation and maintenance of any structures within areas identified as "waters of the State" (such as a culvert or desilting basin) that may require periodic maintenance if these are included in the project design.

Prior to construction, a notification (Streambed Alteration Agreement application) must be submitted to the CDFW that describes any proposed streambed alteration contemplated by the proposed project. In addition to the formal application materials and the fee, a copy of the appropriate environmental document (e.g., mitigated negative declaration [MND]) should be included in the submittal, consistent with CEQA requirements. The CDFW will prepare a draft Streambed Alteration Agreement, which will include standard measures to protect sensitive plant and wildlife resources during project construction and during ongoing operation and maintenance of any project element that occurs within a CDFW jurisdictional area.

If a Streambed Alteration Agreement is required, the CDFW may want to conduct an on-site inspection. The CDFW then prepares a draft agreement, which will include measures to protect fish and wildlife resources that will be directly or indirectly impacted by project construction. The draft agreement will be transmitted to the Applicant within 60 calendar days of the CDFW's determination that the notification is complete. It should be noted that the 60-day timeframe may not apply to long-range operation and maintenance agreements.

The Applicant has 30 calendar days to notify the CDFW concerning the acceptability of the proposed terms, conditions, and measures. If the Applicant agrees with these terms, conditions, and measures, the agreement must be signed and returned to the CDFW. The agreement becomes final once the CDFW executes it and a Streambed Alteration Agreement is issued to the Applicant. Please note that all application fees must be paid and the final certified CEQA documentation must be provided prior to the CDFW's execution of the agreement.

If the CDFW does not respond in writing concerning the completeness of the Notification within 30 days of its submittal, the Notification automatically becomes complete. If the CDFW does not submit a draft Streambed Alteration Agreement to the Applicant within 60 days of the determination of a completed Notification package, the CDFW will issue a letter that either (1) identifies the final date to transmit a draft Streambed Alteration Agreement or (2) indicates that a Streambed Alteration Agreement was not required. The CDFW will also indicate that it was unable to meet this mandated date and that by law the Applicant must complete the project without a Streambed Alteration Agreement and must comply with all avoidance, minimization, and mitigation measures described in the Notification package that was submitted to CDFW.

SECTION 6.0 REFERENCES

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———. 2008c (September). *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0). (J.S. Wakeley, R.W. Lichvar, and C.V. Noble, Eds.). Vicksburg, MS: U.S. Army Engineer Research and Development Center. http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA489704&Location=U2&doc=GetTRDoc.pdf.

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ATTACHMENT A

WETLAND DATA FORMS

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Tujunga Reservoir City/County: unincorporated LA County Sampling Date: 10/27/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 1

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 3 North, 12 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ______ Slope (%): 10

Subregion (LRR): Mediterranean California Lat: 34.30126 Long: 118.17034 Datum: NAD 83

Soil Map Unit Name: Typic Xerorthents, warm, 55 to 90 percent slopes NWI classification: R3USK (R3SBZ)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	✓	
Hydric Soil Present?		✓
Wetland Hydrology Present?	✓	

Is the Sampled Area within a Wetland? **Yes** ______ **No** ✓

Remarks:

2010 Station Fire burned majority of vegetation within survey area

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	15	Y	OBL
2. Salix exigua	10	Y	OBL
3.			
4.			
	25 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1. Xanthium strumarum	5	Y	FAC
2. Baccharis salicifolia	5	Y	FACW
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Mimulus guttatus	40	Y	OBL
2. Persicaria lapathifolia	5	N	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	45 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	5	x 2 =	10
FAC species	5	x 3 =	15
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	80 (A)		95 (B)

Prevalence Index = B/A = 1.19

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ______

Remarks:

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-24	2.5 YR 4/3	100					SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____

Depth (inches): ____

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): ____

Water Table Present? Yes ✓ No ___ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): ____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Tujunga Reservoir City/County: unincorporated LA County Sampling Date: 10/27/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 2

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 3 North, 12 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ______ Slope (%): 10

Subregion (LRR): Mediterranean California Lat: 34.30155 Long: 118.17298 Datum: NAD 83

Soil Map Unit Name: Water NWI classification: R3USK (R3SBZ)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	✓	
Hydric Soil Present?		✓
Wetland Hydrology Present?	✓	

Is the Sampled Area within a Wetland? **Yes** ___ **No** ✓

Remarks:

2010 Station Fire burned majority of vegetation within survey area

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Sisymbrium orientale	2	Y	FACU
2. Mimulus cardinalis	2	Y	OBL
3. Ambrosia psilostachya	2	Y	FAC
4.			
5.			
6.			
7.			
8.			
	6 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 94 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	2	x 1 = 2
FACW species		x 2 =
FAC species	2	x 3 = 6
FACU species	2	x 4 = 8
UPL species		x 5 =
Column Totals:	6 (A)	16 (B)

Prevalence Index = B/A = 2.67

Hydrophytic Vegetation Indicators:

- ✓ Dominance Test is >50%
- ✓ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-24	2.5 YR 4/2	100					SAND	COARSE SAND AND GRAVEL

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ________

Depth (inches): ________

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
✓ High Water Table (A2)
✓ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ____ Depth (inches): ____

Water Table Present? Yes ✓ No ____ Depth (inches): 5

Saturation Present? (includes capillary fringe) Yes ✓ No ____ Depth (inches): 5

Wetland Hydrology Present? Yes ✓ No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Tujunga Reservoir City/County: unincorporated LA County Sampling Date: 10/27/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 3

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 3 North, 12 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ______ Slope (%): 10

Subregion (LRR): Mediterranean California Lat: 34.30160 Long: 118.17619 Datum: NAD 83

Soil Map Unit Name: Water NWI classification: R3USK (R3SBZ)

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	Is the Sampled Area within a Wetland? Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

2010 Station Fire burned majority of vegetation within survey area

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1. Salix gooddingii	2	Y	OBL
2.			
3.			
4.			
	2 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 98 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	2	x 1 = 2
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	2 (A)	2 (B)

Prevalence Index = B/A = 1.0

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-24	2.5 YR 4/3	100					SAND	COARSE SAND AND GRAVEL

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 9

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Tujunga Reservoir City/County: unincorported LA County Sampling Date: 10/27/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 4

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 3 North, 12 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ______ Slope (%): 10

Subregion (LRR): Mediterranean California Lat: 34.30052 Long: 118.18384 Datum: NAD 83

Soil Map Unit Name: Water NWI classification: L2FLKY

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ___	Is the Sampled Area within a Wetland? Yes ✓ No ___
Hydric Soil Present?	Yes ✓	No ___	
Wetland Hydrology Present?	Yes ✓	No ___	

Remarks:

2010 Station Fire burned majority of vegetation within survey area

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5')			
1. Typha sp.	1	Y	OBL
2. Chamaesyce maculata	1	Y	FAC
3.			
4.			
5.			
	2	= Total Cover	
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 98 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species		x 2 =	
FAC species	1	x 3 =	3
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	2 (A)		4 (B)

Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-24	2.5 YR 2.5/1	100	10 YR 5/4	5	RM	M	CLAY-SILT	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present? Yes ✓ **No** ______

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		✓	
Water Table Present?	✓		7
Saturation Present? (includes capillary fringe)	✓		0

Wetland Hydrology Present? Yes ✓ **No** ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Soil pit location is within portion of reservoir that is typically inundated. Reservoir was inundated approximately 30 feet downstream of pit location.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Tujunga Wash City/County: unincorported LA County Sampling Date: 9/28/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 5

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 2 North, 13 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ______ Slope (%): 10

Subregion (LRR): Mediterranean California Lat: 34.29308 Long: 118.18931 Datum: NAD 83

Soil Map Unit Name: Rock outcrop-Chilao family-Haploxerolls, warm association, 15 to 120 p NWI classification: PEMY

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	Is the Sampled Area within a Wetland? Yes ___ No ✓
Hydric Soil Present?	Yes ___ No ✓	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Persicaria lapathifolia	5	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 95 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	5	x 1 = 5
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	5 (A)	5 (B)

Prevalence Index = B/A = 1.0

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

Sample point is located at downstream end of Big Tujunga Dam plunge pool. Site is mostly bare ground and boulders. Soil pit is immediately adjacent to flowing water.

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	2.5 Y 4/2	100					GRAVEL	
5-12	2.5 Y 3/1	100					CLAY-SILT	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: COBBLE

Depth (inches): 12

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

✓ Surface Water (A1)
___ High Water Table (A2)
✓ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ______ Depth (inches): ____________

Water Table Present? Yes ______ No ✓ Depth (inches): ____________

Saturation Present? (includes capillary fringe) Yes ✓ No ______ Depth (inches): 2

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Tujunga Wash City/County: unincorporated LA County Sampling Date: 9/28/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 6

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 2 North, 13 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ______ Slope (%): 10

Subregion (LRR): Mediterranean California Lat: 34.29260 Long: 118.19001 Datum: NAD 83

Soil Map Unit Name: Rock outcrop-Chilao family-Haploxerolls, warm association, 15 to 120 p NWI classification: PEMY

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?	✓	
Hydric Soil Present?		✓
Wetland Hydrology Present?	✓	

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rhombifolia	15	Y	FACW
2. Salix lasiolepis	10	Y	OBL
3. Nicotiana glauca	5	N	FAC
4.			
	30	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5')			
1. Lotus scoparius	20	Y	UPL
2. Salvia mellifera	10	Y	UPL
3. Conyza canadensis	5	N	FAC
4.			
5.			
	35	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Xanthium strumarum	20	Y	FAC
2. Veronica anagalis-aquatica	20	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	40	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 70 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species	15	x 2 =	30
FAC species	10	x 3 =	30
FACU species		x 4 =	
UPL species	30	x 5 =	150
Column Totals:	85 (A)		240 (B)

Prevalence Index = B/A = ______

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	2.5 Y 4/1	100					SILTY CLAY	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: COBBLE

Depth (inches): 2

Hydric Soil Present? Yes ______ No ✓

Remarks:

Sample point is located immediately adjacent to to flowing water though soil is a thin layer of silty clay on top of cobble.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

✓ Surface Water (A1)
___ High Water Table (A2)
✓ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ______ Depth (inches): ______
Water Table Present? Yes ______ No ✓ Depth (inches): ______
Saturation Present? (includes capillary fringe) Yes ✓ No ______ Depth (inches): 1

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Tujunga Wash City/County: unincorported LA County Sampling Date: 9/28/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 7

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 2 North, 13 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ______ Slope (%): 10

Subregion (LRR): Mediterranean California Lat: 34.29010 Long: 118.19347 Datum: NAD 83

Soil Map Unit Name: Rock outcrop-Chilao family-Haploxerolls, warm association, 15 to 120 p NWI classification: PEMY

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ___	**Is the Sampled Area within a Wetland?** **Yes** ✓ **No** ___
Hydric Soil Present?	Yes ✓ No ___	
Wetland Hydrology Present?	Yes ✓ No ___	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	80	Y	OBL
2.			
3.			
4.			
	80 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1. Typha sp.	20	Y	OBL
2.			
3.			
4.			
5.			
	20 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Persicaria lapathifolia	15	Y	OBL
2. Rorippa naturtium-aquatica	5	Y	OBL
3. Ageratina adenophora	5	N	NI
4. Xanthium strumarium	5	N	FAC
5. Mimulus cardinalis	1	N	OBL
6.			
7.			
8.			
	31 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	121	x 1 =	121
FACW species		x 2 =	
FAC species	5	x 3 =	15
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	126 (A)		136 (B)

Prevalence Index = B/A = 1.08

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ✓ **No** ___

Remarks:

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5 Y 4/2	100					CLAY-SILT	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: COBBLE

Depth (inches): 4

Hydric Soil Present? Yes ✓ No ___

Remarks:

Hydric soil conditions are assumed due to perennial water and presence of wetland vegetation

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

✓ Surface Water (A1)
✓ High Water Table (A2)
✓ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
___ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): ___
Water Table Present? Yes ✓ No ___ Depth (inches): 3
Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Big Tujunga Wash City/County: unincorported LA County Sampling Date: 9/28/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 8

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 2 North, 13 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ______ Slope (%): 10

Subregion (LRR): Mediterranean California Lat: 34.28540 Long: 118.19557 Datum: NAD 83

Soil Map Unit Name: Rock outcrop-Chilao family-Haploxerolls, warm association, 15 to 120 p NWI classification: PEMY

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	40	Y	OBL
2. Populus fremontii	10	Y	FACW
3.			
4.			
	50 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1. Typha sp.	10	Y	OBL
2.			
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Persicaria lapathifolia	5	Y	OBL
2. Cyperus eragrostis	2	Y	OBL
3. Polypogon monspeliensis	2	Y	FACW
4.			
5.			
6.			
7.			
8.			
	9 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 80 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	57	x 1 = 57
FACW species	12	x 2 = 24
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column Totals:	69 (A)	81 (B)

Prevalence Index = B/A = 1.17

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

Sample point is at interface between artificially hardened bank and flowing water. Vegetation is growing at water edge and on an island within the OHWM.

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5 Y 4/2	100					GRAVEL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

__ Histosol (A1)
__ Histic Epipedon (A2)
__ Black Histic (A3)
__ Hydrogen Sulfide (A4)
__ Stratified Layers (A5) (**LRR C**)
__ 1 cm Muck (A9) (**LRR D**)
__ Depleted Below Dark Surface (A11)
__ Thick Dark Surface (A12)
__ Sandy Mucky Mineral (S1)
__ Sandy Gleyed Matrix (S4)
__ Sandy Redox (S5)
__ Stripped Matrix (S6)
__ Loamy Mucky Mineral (F1)
__ Loamy Gleyed Matrix (F2)
__ Depleted Matrix (F3)
__ Redox Dark Surface (F6)
__ Depleted Dark Surface (F7)
__ Redox Depressions (F8)
__ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

__ 1 cm Muck (A9) (**LRR C**)
__ 2 cm Muck (A10) (**LRR B**)
__ Reduced Vertic (F18)
__ Red Parent Material (TF2)
__ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: COBBLE/GUNNITE

Depth (inches): 4

Hydric Soil Present? Yes ✓ No ___

Remarks:

This area has a thin layer of fine material mixed in with gravel. Below 4 inches is where this area has been artificially hardened. Presence of hydric soils is assumed as areas immediately adjacent to sample point are perennially inundated.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

✓ Surface Water (A1)
✓ High Water Table (A2)
✓ Saturation (A3)
__ Water Marks (B1) (**Nonriverine**)
__ Sediment Deposits (B2) (**Nonriverine**)
__ Drift Deposits (B3) (**Nonriverine**)
__ Surface Soil Cracks (B6)
__ Inundation Visible on Aerial Imagery (B7)
__ Water-Stained Leaves (B9)
__ Salt Crust (B11)
__ Biotic Crust (B12)
__ Aquatic Invertebrates (B13)
__ Hydrogen Sulfide Odor (C1)
__ Oxidized Rhizospheres along Living Roots (C3)
__ Presence of Reduced Iron (C4)
__ Recent Iron Reduction in Tilled Soils (C6)
__ Thin Muck Surface (C7)
__ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

__ Water Marks (B1) (**Riverine**)
__ Sediment Deposits (B2) (**Riverine**)
__ Drift Deposits (B3) (**Riverine**)
__ Drainage Patterns (B10)
__ Dry-Season Water Table (C2)
__ Crayfish Burrows (C8)
__ Saturation Visible on Aerial Imagery (C9)
__ Shallow Aquitard (D3)
__ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 1

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Maple Canyon Sediment Placement Site City/County: unincorporated LA County Sampling Date: 9/28/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 9

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 2 North, 13 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ______ Slope (%): 30

Subregion (LRR): Mediterranean California Lat: 34.28463 Long: 118.19062 Datum: NAD 83

Soil Map Unit Name: Olete-Kilburn-Etsel families complex, 50 to 80 percent slopes NWI classification: PFOY

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No
Hydrophytic Vegetation Present?		✓
Hydric Soil Present?		✓
Wetland Hydrology Present?	✓	

Is the Sampled Area within a Wetland? Yes ___ No ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1. Mimulus cardinalis	5	Y	OBL
2. Salix lasiolepis	5	Y	OBL
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Melilotus alba	25	Y	FACU
2. Medicago polymorpha	25	Y	UPL
3. Veronica nasturtium-aquatica	10	N	OBL
4. Rumex crispus	10	N	FACW
5. Ambrosia psilostachya	5	N	FAC
6.			
7.			
8.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 30 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	20	x 1 = 20
FACW species	10	x 2 = 20
FAC species	5	x 3 = 15
FACU species	25	x 4 = 100
UPL species	25	x 5 = 125
Column Totals:	85 (A)	280 (B)

Prevalence Index = B/A = 3.3

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

Vegetation consists mostly of weedy herbaceous species within a debris basin adjacent to Big Tujunga Canyon Road.

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10 YR 4/3	100					SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present? **Yes** ______ **No** ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ______ No ✓ Depth (inches): ______

Water Table Present? Yes ✓ No ______ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ✓ No ______ Depth (inches): 4

Wetland Hydrology Present? **Yes** ✓ **No** ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Maple Canyon Sediment Placement Site City/County: unincorporated LA County Sampling Date: 9/28/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 10

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 2 North, 12 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ____ Slope (%): 10

Subregion (LRR): Mediterranean California Lat: 34.28250 Long: 118.18048 Datum: NAD 83

Soil Map Unit Name: Olete-Kilburn-Etsel families complex, 50 to 80 percent slopes NWI classification: ____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓
Hydric Soil Present?	Yes ____	No ✓
Wetland Hydrology Present?	Yes ✓	No ____

Is the Sampled Area within a Wetland? Yes ____ No ✓

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5')			
1. Salsola tragus	60	Y	UPL
2. Brassica nigra	40	Y	UPL
3. Ambrosia acanthicarpa	30	Y	UPL
4.			
5.			
6.			
7.			
8.			
	130 = Total Cover		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species	130	x 5 = 650
Column Totals:	130 (A)	650 (B)

Prevalence Index = B/A = 5

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10 YR 4/2	100					SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: hard pan

Depth (inches): 6

Hydric Soil Present? Yes ______ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ✓ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ______	No ✓	Depth (inches): ______
Water Table Present?	Yes ______	No ✓	Depth (inches): ______
Saturation Present? (includes capillary fringe)	Yes ______	No ✓	Depth (inches): ______

Wetland Hydrology Present? Yes ✓ No ______

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

sample point is at the upper portion of sediment placement site where two ephemeral drainages come together before a 72" corrugated pipe collects water that runs underground through the site. Sediment has collected here as this area acts as a debris basin.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Maple Canyon Sediment Placement Site City/County: unincorporated LA County Sampling Date: 9/28/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 11

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 2 North, 12 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ______ Slope (%): 30

Subregion (LRR): Mediterranean California Lat: 34.28327 Long: 118.18240 Datum: NAD 83

Soil Map Unit Name: Rock outcrop-Chilao family-Haploxerolls, warm association, 15 to 120 p NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ___ (If no, explain in Remarks.)

Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No ✓	Is the Sampled Area within a Wetland? Yes ___ No ✓
Hydric Soil Present?	Yes ___	No ✓	
Wetland Hydrology Present?	Yes ✓	No ___	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
= Total Cover	0		
Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
= Total Cover	0		
Herb Stratum (Plot size: 5')			
1. Brassica nigra	80	Y	UPL
2. Ambrosia acanthicarpa	20	N	UPL
3. Bromus madritensis ssp. rubens	10	N	UPL
4. Melilotus alba	5	N	FACU
5.			
6.			
7.			
8.			
= Total Cover	115		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
= Total Cover	0		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species	5	x 4 = 20
UPL species	110	x 5 = 550
Column Totals:	115 (A)	570 (B)

Prevalence Index = B/A = 4.9

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No ✓

Remarks:

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10 YR 2/1	100					SILTY SAN	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) (**LRR C**)
___ 1 cm Muck (A9) (**LRR D**)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) (**LRR C**)
___ 2 cm Muck (A10) (**LRR B**)
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: hard pan

Depth (inches): 8

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1) (**Nonriverine**)
___ Sediment Deposits (B2) (**Nonriverine**)
___ Drift Deposits (B3) (**Nonriverine**)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Biotic Crust (B12)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water Marks (B1) (**Riverine**)
✓ Sediment Deposits (B2) (**Riverine**)
___ Drift Deposits (B3) (**Riverine**)
✓ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___
Water Table Present? Yes ___ No ✓ Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Maple Canyon Sediment Placement Site City/County: unincorporated LA County Sampling Date: 9/28/11

Applicant/Owner: Los Angeles County Department of Public Works/U.S. Forest Service State: CA Sampling Point: 12

Investigator(s): Gary Medeiros, David Hughes Section, Township, Range: 2 North, 12 West

Landform (hillslope, terrace, etc.): Foothills Local relief (concave, convex, none): ______ Slope (%): 30

Subregion (LRR): Mediterranean California Lat: 34.28443 Long: 118.18302 Datum: NAD 83

Soil Map Unit Name: Rock outcrop-Chilao family-Haploxerolls, warm association, 15 to 120 p NWI classification: ______

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ______ (If no, explain in Remarks.)

Are Vegetation ______, Soil ______, or Hydrology ______ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ______

Are Vegetation ______, Soil ______, or Hydrology ______ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

	Yes	No	
Hydrophytic Vegetation Present?		✓	**Is the Sampled Area within a Wetland?** Yes ______ No ✓
Hydric Soil Present?		✓	
Wetland Hydrology Present?	✓		

Remarks:

Sample point is within debris basin area. Significant sand and rock has washed down from adjacent steep side canyon.

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Brassica nigra	30	Y	UPL
2. Ambrosia acanthicarpa	30	Y	UPL
3. Salsola tragus	10	N	UPL
4.			
5.			
6.			
7.			
8.			
	70	= Total Cover	
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species	70	x 5 = 350
Column Totals:	70 (A)	350 (B)

Prevalence Index = B/A = 5

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ______ No ✓

Remarks:

ATTACHMENT B

SOIL SURVEY

The soil classifications identified below was obtained from the U.S. Department of Agriculture, Natural Resources Conservation Service[3]. The Official Soil Series Descriptions were obtained from the Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture.

Stukel Series

The Stukel series consists of shallow, well drained soils that formed in slope alluvium derived from pumiceous tuff. These soils are on shoulders of hills and adjacent to rock outcrops. Slopes are 60 to 100 percent. The mean annual precipitation is approximately 27 to 39 inches and the mean annual temperature is approximately 55 to 64 degrees Fahrenheit (°F).

Range in Characteristics:

The soil is shallow to consolidated sediments. Depth is 8 to 18 inches to lithic bedrock.

The A horizon has dry color of 10YR 4/3, 5/2, or 5/3. Moist color is 10YR 3/2 or 3/3. Reaction is slightly acid or neutral. The particle size control section is 10 to 18 percent clay.

Drainage and Permeability:

Stukel soils are classified as somewhat excessively drained.

Trigo Series

The Trigo series is a loamy, mixed, superactive, nonacid, thermic, shallow Typic Xerorthent. It consists of shallow, well drained soils formed in consolidated alluvium from mixed sources on dissected terraces. Slopes are 2 to 60 percent. The mean annual precipitation is approximately 10 inches and the mean annual temperature is approximately 61 degrees °F.

Range in Characteristics:

The soil is shallow to consolidated sediments. Depth is 6 to 20 inches. The mean annual soil temperature is 59 to 65 °F. The soil is moist for about 100 days when the soil temperature is above 41 °F.

The A horizon is 2.5Y or 10YR 5/2, 5/3, 6/2, 6/3 or 7/2 dry, and 2.5Y or 10YR 3/3, 4/2, 4/3, 4/4 or 5/2 dry. Reaction is slightly acid or neutral. The particle size control section is 8 to 18 percent clay.

The C horizon is 2.5Y or 10YR 5/3, 6/2, 6/3, 6/4 or 7/2. Moist color is 2.5Y or 10YR 4/2, 4/3. 5/2, 5/4 or 6/4. Reaction is slightly acid to slightly alkaline. Some areas have a few lime seams and are slightly effervescent in the lower part.

Drainage and Permeability:

Trigo soils are well drained, have medium to rapid runoff, and have moderately rapid permeability.

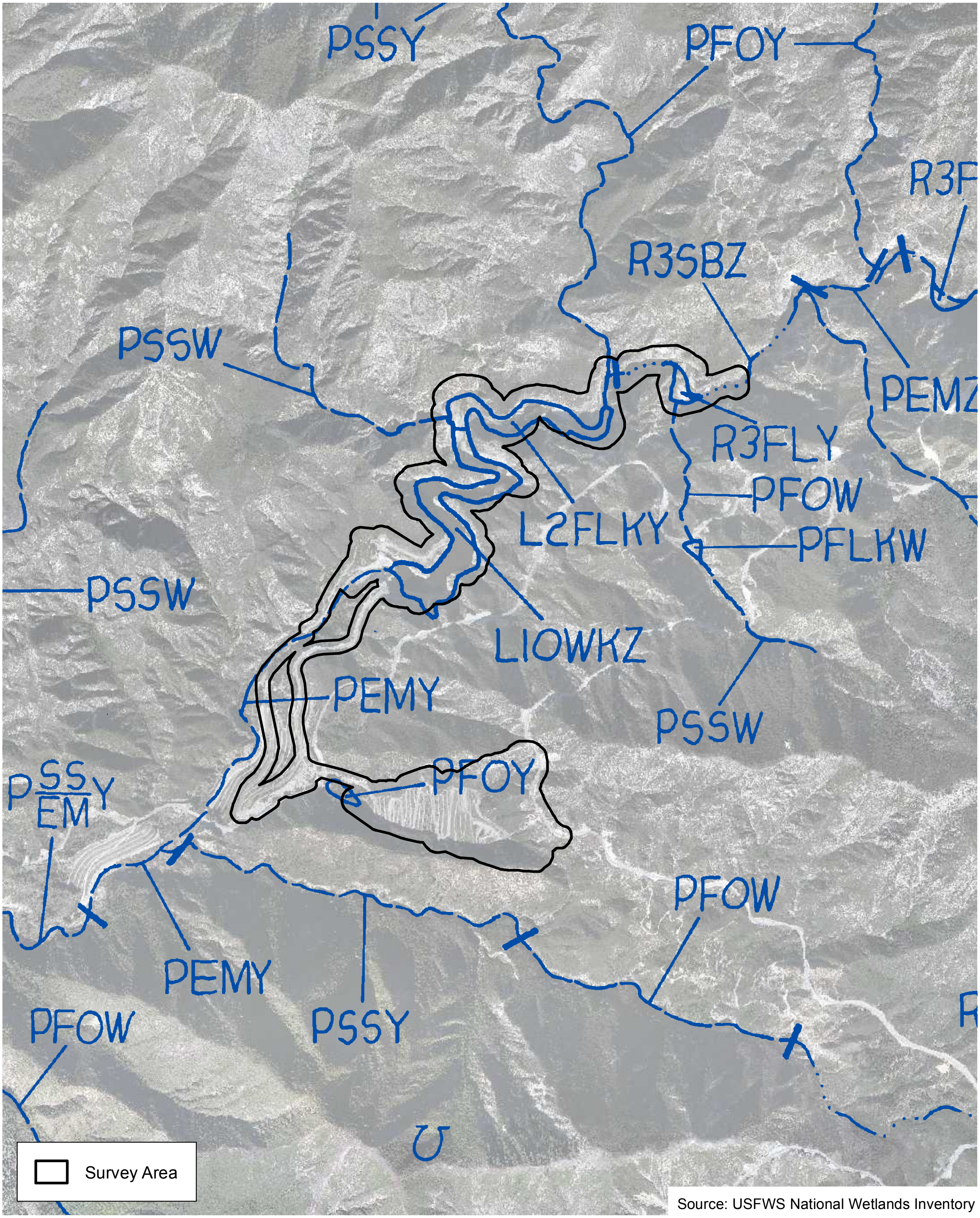
[3] U.S. Department of Agriculture, Natural Resources Conservation Service (USDA NRCS). 2011 (February). Official Soil Series Descriptions (Tujunga). Fort Worth, TX: USDA, NRCS. http://soils.usda.gov/technical/classification/osd/index.html.

Typic Xerorthents

The Typic subgroup of Xerorthents consists of soils that are moderately deep or deep to hard rock, do not have ground water within a depth of 150 cm, and are not partially cemented by silica. These soils have a base saturation of 60 percent or more in some part at a depth of between 25 and 75 cm below the soil surface. Soils that have a shallow lithic contact are excluded from the Typic subgroup, a convention used throughout this taxonomy. Soils that are partially cemented by silica are excluded because such soils are thought to represent intergrades to Durixerepts. Commonly, Typic Xerorthents are in a sandy-skeletal family or have a thin ochric epipedon that rests on a densic or paralithic contact with weakly cemented rock or dense sediments. Some of these soils have been cultivated for a long time or have been reshaped for irrigation and consist of what was the C horizon of other soils, chiefly Xeralfs and Xerolls. Typic Xerorthents are used mostly as forest or grazing land. A few of these soils are used as cropland, and a few are idle.

ATTACHMENT C

NATIONAL WETLANDS INVENTORY



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National Wetland Inventory

Attachment C

Big Tujunga Reservoir Sediment Removal Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

(Rev: 1-13-2012 CJS) \PAS\Projects\CoLADPW\J162\Graphics\JD_Report\ExC_wet_inventory.pdf

ATTACHMENT D

SITE PHOTOGRAPHS

Big Tujunga Reservoir, upstream portion looking downstream. October 27, 2011

Big Tujunga Reservoir, reservoir midpoint portion looking upstream. October 27, 2011

Big Tujunga Reservoir, reservoir midpoint portion looking downstream. October 27, 2011

D:\Projects\CoLADPW\J162\Graphics\Ex_JD_photosA.ai

Site Photographs

Exhibit D-1

Big Tujunga Reservoir Sediment Removal Project

BonTerra CONSULTING

(Rev: 02/01/12 CJS) PAS\Projects\CoLADPW\J162\Graphics\JD_Report\ExD-1_jd_photosA.pdf

Plunge pool immediately downstream of Big Tujunga Dam. September 28, 2011

Big Tujunga Wash, looking downstream from plunge pool. September 28, 2011

Big Tujunga Wash, looking upstream from culvert bridge. September 28, 2011

D:\Projects\CoLADPW\J162\Graphics\Ex_JD_photosB.ai

Site Photographs

Exhibit D-2

Big Tujunga Reservoir Sediment Removal Project

BonTerra CONSULTING

(Rev: 02/01/12 CJS) PAS\Projects\CoLADPW\J162\Graphics\JD_Report\ExD-2_jd_photosB.pdf

Big Tujunga Wash, looking downstream from culvert bridge. September 28, 2011

Big Tujunga Wash, looking downstream from soil pit 7. September 28, 2011

Big Tujunga Wash, looking upstream from downstream end of survey area. September 28, 2011

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Site Photographs

Exhibit D-3

Big Tujunga Reservoir Sediment Removal Project

BonTerra CONSULTING

(Rev: 02/01/12 CJS) PAS\Projects\CoLADPW\J162\Graphics\JD_Report\ExD-3_jd_photosC.pdf

Unnamed drainge within Maple Canyon SPS, facing upstream from soil pit 10. September 28, 2011

Unnamed drainge within Maple Canyon SPS, facing upstream from soil pit 11. September 28, 2011

Unnamed drainge within Maple Canyon SPS, facing upstream from soil pit 12. September 28, 2011

D:\Projects\CoLADPW\J162\Graphics\Ex_JD_photosD.ai

Site Photographs

Exhibit D-4

Big Tujunga Reservoir Sediment Removal Project

BonTerra CONSULTING

APPENDIX B-3

ARROYO TOAD SURVEY LETTER REPORT

October 11, 2011

Ms. Erin M. McCarthy
Recovery Permit Coordinator
U.S. Fish and Wildlife Service
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

VIA EMAIL
erin_mccarthy@fws.gov

Subject: Results of Focused Presence/Absence Surveys for Arroyo Toad for the Big Tujunga Reservoir Sediment Removal Project, Los Angeles County, California

Dear Ms. McCarthy:

This Letter Report presents the results of focused diurnal and nocturnal surveys to determine the presence or absence of the arroyo toad (*Anaxyrus californicus*) upstream of the Big Tujunga Reservoir for the Big Tujunga Reservoir Sediment Removal Project.

Survey Area

The survey area for these focused surveys consists of Big Tujunga Creek extending approximately two river miles upstream of Big Tujunga Dam. The study area is located in Big Tujunga Canyon on the southern edge of the San Gabriel Mountains, within the Angeles National Forest (ANF) (Exhibit 1). It is represented on the U.S. Geological Survey's (USGS') Condor Peak 7.5-minute topographic quadrangle at Township 3 North, Range 12 West, within Sections 29, 31, and 32 (Exhibit 2). Topography in the survey area consists of sheer cliffs and steep slopes to the canyon bottom, with elevations ranging from approximately 2,150 to 3,400 feet above mean sea level (msl). The survey area consists of open space.

Survey Area Conditions

Big Tujunga Creek travels roughly west, and several tributaries from the north and south join it as it flows to Big Tujunga Reservoir. Big Tujunga Canyon is characterized by very steep slopes, shallow soils, and watercourses contained within bedrock channels. Erosion has deposited alluvium (including boulders, cobbles, gravels, and coarse to fine sandy soils) within the stream course. Topography is irregular, and stream grade and flow velocity range across a moderate spectrum. Stream morphology includes portions with narrow, incised, fast-moving streams with plunge pools; wider, slow-moving streams; and a relatively broad alluvial wash with multiple meanders where the creek flows into the reservoir. Representative photographs of the study area are provided in Attachment A.

Vegetation within the survey area consists mainly of willow riparian forest dominated by arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*); however, in some areas it is co-dominated by white alder (*Alnus rhombifolia*) and Fremont cottonwood (*Populus fremontii* ssp. *fremontii*). Other common species present include mule fat (*Baccharis salicifolia*), nettle (*Urtica dioica*), and mugwort (*Artemisia douglasiana*). In upland areas, coast live oaks (*Quercus agrifolia*) and western sycamores (*Platanus racemosa*) are also present. In less mature/more recently disturbed areas within the wash, southern riparian scrub is present, dominated by mule fat, arroyo willow, and red willow.

In alluvial terraces and slopes above the main stream course, alluvial scrub and chaparral are present, dominated by scale-broom (*Lepidospartum squamatum*); other common species include thick-leaf yerba santa (*Eriodictyon crassifolium*), California buckwheat (*Eriogonum fasciculatum*), Our Lord's candle (*Yucca whipplei*), black sage (*Salvia mellifera*), deerweed (*Acmispon glaber* [*Lotus scoparius*]), and laurel sumac (*Malosma laurina*). Portions of the survey area burned in the 2009 Station Fire. Many of the burned trees and shrubs are resprouting from the base. Poodledog bush (*Turricula parryi*), a fire-following species, is widespread throughout the survey area.

<u>Background Information</u>

The arroyo toad was listed as a federally Endangered species by the U.S. Fish and Wildlife Service (USFWS) on December 16, 1994, and is considered a California Species of Special Concern (USFWS 1994; CDFG 2011). At the time of listing, the arroyo toad (*Anaxyrus californicus*) was considered a subspecies of southwestern arroyo toad (*Bufo microscaphus)* until genetic studies (Gergus 1998) separated the arroyo toad (*B. californicus*) from the Arizona toad (*B. microscaphus*). Recent research (Frost et al. 2006) places both species in the genus *Anaxyrus*.

The arroyo toad is stocky and uniformly warty, with a light-colored stripe across the head between and including the eyelids. The parotid glands are oval-shaped, widely separated, and pale toward the front. The underside of the arroyo toad is usually buff-colored and unspotted, and the cranial crests are absent or weak. Reproductive adult toads typically range from 2 to 2.6 inches snout-vent length (svl) for males and 2.6 to 3.1 inches for females (Sweet 1992, 1993). Tadpoles reach an average maximum length of 1.3 inches (maximum of 1.6 inches) and are black in coloration at hatching, developing tan dorsum and crossbars on the tail and an opaque, white venter before metamorphosing (Sweet 1992).

Early descriptions of the habitat requirements for the arroyo toad are based on detailed life history studies conducted over a period of years by Dr. Samuel Sweet (1992, 1993). Much of that work was conducted in the Los Padres National Forest in Santa Barbara County. Subsequent to this work, additional studies of populations in other portions of the range have resulted in a somewhat broader habitat description (e.g., Griffin et al. 1999; Ramirez 1999, 2000, 2001, 2002a, 2002b, 2002c). It can generally be said that the arroyo toad frequents third order washes, streams, and arroyos in semiarid parts of the southwest. Stream substrates range from sands to small cobble, with sandy banks supporting mule fat, willows (*Salix* spp.), cottonwoods (*Populus* spp.), and/or sycamores. The arroyo toad breeds both within streams and in small backwater pools that form along the stream margins, usually in relatively shallow water (ten centimeters or four inches) with sand or gravel substrate.

Arroyo toads are nocturnal and will move extensively in upland habitats and seasonally. Adult males will sometimes travel 1.2 to 1.9 miles along a stream coarse, often becoming more sedentary once reaching a large size (Sweet 1992). Females are more sedentary, typically maintaining an area of movement less than 330 feet in diameter (Sweet 1992). Adults feed primarily on ants, particularly nocturnal, trail-forming tree ants (*Liometopum occidentale*), but will also consume other invertebrates (Sweet 1992). Tadpoles are substrate gleaners, feeding on detritus and microbial mats from just beneath the surface layer of fine sediments or within the interstices of gravel deposits (Sweet 1992).

During the breeding season, typically from February to July, males will make advertisement vocalizations above water from shallow areas along the creek margins. The advertisement call is a whistling trill that lasts from 4 to 9 seconds in duration and is audible up to 300 meters under ideal conditions (Gergus et al. 1997). Egg strings of 2,000 to 10,000 eggs are deposited in shallow water (less than 4 inches in depth) on fine sediment with very low current and hatch 4 to 6 days later (Sweet 1992). Larval stage length ranges from 65 to 80 days post-hatching (Sweet 1992).

On February 7, 2001, the USFWS published a final rule designating 182,360 acres of land in Monterey, Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego Counties, California as critical habitat for the arroyo toad (USFWS 2001). Following the designation of critical habitat, several lawsuits were filed challenging various aspects of the designation. In response to these lawsuits, the critical habitat designation was vacated and the USFWS was instructed by the court to re-evaluate its previous position.

On April 13, 2005, the USFWS published a final rule designating 11,695 acres of critical habitat for the arroyo toad in portions of Santa Barbara, Ventura, Los Angeles, Riverside, and San Bernardino Counties, California (USFWS 2005). The final critical habitat designation reflects the exclusion of 13 units totaling 67,584 acres based solely on economic considerations. These units are located in Santa Barbara, Ventura, Los Angeles, Orange, Riverside, San Bernardino, and San Diego Counties. Portions of two other units in Orange and San Diego Counties were excluded from critical habitat based on economic considerations and a combination of other factors. All proposed critical habitat in Monterey, Orange, and San Diego Counties has been excluded in the final rule.

Following a challenge of the 2005 critical habitat designation by the Centers for Biological Diversity (CBD) on December 19, 2007, a settlement agreement was reached in which the USFWS would reconsider the designation and submit a proposed revised critical habitat rule for the arroyo toad to the Federal Register by October 1, 2009. The revised critical habitat rule was released on February 8, 2011 (USFWS 2011).

The survey area is within designated critical habitat Unit 7 (Upper Los Angeles River Basin), which includes 1,190 acres in the ANF. Unit 7 encompasses (1) approximately 8 miles of upper Big Tujunga Creek from immediately above Big Tujunga Reservoir upstream to 1.2 miles above the confluence with Alder Creek; (2) approximately 3.7 miles of Mill Creek from the Monte Cristo Creek confluence downstream to Big Tujunga Creek; and (3) 1.9 miles of Alder Creek from the Mule Fork confluence downstream to Big Tujunga Creek. Unit 7 supports an arroyo toad population that is considered important because it occurs at a relatively high elevation considered atypical for the species, and it is the only known population remaining in the coastal foothills of the San Gabriel Mountains.

Survey Methodology

An initial site assessment was conducted by BonTerra Consulting Senior Biologist Sam Stewart on March 17, 2011, to determine the extent of potentially suitable habitat for the arroyo toad. The site assessment determined that Big Tujunga Creek upstream from the reservoir provides potentially suitable habitat for the arroyo toad. In accordance with the arroyo toad protocol (USFWS 1999), surveys were conducted in suitable habitat up to 1 kilometer from the project limits of disturbance, which includes Big Tujunga Creek from the reservoir to the Fall Creek Campground/USFS Road 3N27 approximately one kilometer upstream. Prior to conducting the focused surveys, a search of the California Natural Diversity Database (CNDDB) (CDFG 2011) and other relevant available documents (Jennings and Hayes 1994; Campbell et al. 1996) was conducted to determine if and to what extent the arroyo toad occurs in the project vicinity.

Surveys for arroyo toad were conducted by Mr. Stewart and BonTerra Consulting Biologists Jason Mintzer and Jonathan Aguayo according to the USFWS-established survey methodology. Mr. Stewart was the Principal Investigator and was present during all surveys. Six survey visits were conducted between April 20 and June 27, 2011, each including diurnal and nocturnal components completed within the same 24-hour period.

Diurnal surveys were conducted from approximately 3:00 PM until dusk, and nocturnal surveys were conducted from one hour after dusk until approximately 1:00 AM. Surveys focused on detecting toads by visual identification; listening for the advertising call of adult males; and checking potentially suitable breeding habitat for tadpoles and/or eggs. Survey biologists scanned pools for eggs, larvae, metamorphs, juveniles, and breeding and/or calling adults in potentially suitable breeding locations along the stream, and for foraging individuals in the adjacent riparian and upland areas. Surveyors moved in a downstream direction during the diurnal surveys, and moved in an upstream direction during the nocturnal surveys. Headlamps (Black Diamond Icon – 100 lumens), flashlights (Surefire E2L Outdoorsman - 60 lumens), and binoculars (Pentax DCF SP 10x42) were used to visually identify toads, frogs, and their larvae detected at night. Nocturnal surveys were conducted during appropriate environmental conditions conducive to the activity patterns for the arroyo toad. Generally, these conditions are night time temperatures in excess of 50 degrees Fahrenheit (°F) at dusk, with low winds (less than 10 miles per hour), and avoiding nights with a full or nearly full moon. Survey dates, times, and weather data are shown in Table 1.

Any arroyo toads detected during surveys were documented in field notes. The following data were collected for all arroyo toad observations: (1) time of initial observation; (2) meteorological conditions at time of initial observation (including temperature, relative humidity, wind speed, and barometric pressure); (3) geographic positioning system (GPS) coordinates; (4) dorsal photographs; and (5) snout-vent length as measured utilizing calipers or by placing a scale adjacent during the dorsal photograph.

TABLE 1
SUMMARY OF ARROYO TOAD SURVEY CONDITIONS

Survey	Survey Date	Survey Type	Surveying Biologists	Start/End Time	Wind (miles/hour)		Temperature (°F)		Relative Humidity (%)		Cloud Cover
					Start	End	Start	End	Start	End	
1	4/20/2011	Diurnal	S. Stewart, J. Mintzer	15:45–19:30	2–5	0–1	65	61	40	47	clear
		Nocturnal		20:15–23:45	0–1	calm	61	58	47	52	clear
2	5/3/2011	Diurnal	S. Stewart, J. Mintzer	15:30–20:00	2–6	1–3	81	75	25	39	clear
		Nocturnal		20:30–00:05	3–5	2–3	67	64	42	43	clear
3	5/10/2011	Diurnal	S. Stewart, J. Mintzer	14:45–19:50	3–5	1–3	72	64	31	42	clear
		Nocturnal		20:27–00:35	calm	calm	56	55	57	70	clear
4	5/31/2011	Diurnal	S. Stewart, J. Mintzer	15:15–20:00	3–5	0–1	70	64	40	38	10%
		Nocturnal		20:45–01:10	calm	calm	59	55	45	55	clear
5	6/14/2011	Diurnal	S. Stewart, J. Mintzer	15:10–20:15	1–3	2–4	90	80	23	35	clear
		Nocturnal		21:10–01:35	2–3	2–3	75	72	44	41	clear
6	6/27/2011	Diurnal	S. Stewart, J. Aguayo	15:20–20:15	0–5	1–3	93	82	28	27	clear
		Nocturnal		21:15–01:25	calm	calm	74	67	27	17	clear

Survey Results

Arroyo toad was detected in the survey area upstream of the dam during the 2011 focused surveys. One individual adult male was observed during surveys conducted on May 10, May 31, and June 14, 2011. No arroyo toads were observed on the other survey dates. Based on comparison of dorsal photographs taken during each survey, the adult male toad was determined to be the same individual repeatedly detected during each survey. While this particular toad was observed vocalizing on May 10 and May 31, no evidence of successful breeding was detected in the survey area on these or subsequent visits. The locations of the arroyo toad observations are presented on Exhibit 3. Dorsal photographs taken during surveys are presented in Attachment A.

Other amphibian species detected during surveys include western toad (*Anaxyrus boreas*), California treefrog (*Pseudacris cadaverina*), and Baja California treefrog (*Pseudacris hypochondriaca*). A list of all wildlife species observed within the survey area is included in Attachment B to this letter report.

Three non-target special status species were observed during surveys. These include two California Species of Special Concern: two-striped garter snake (*Thamnophis hammondii*) and yellow warbler (*Dendroica petechia*). The American peregrine falcon (*Falco peregrinus anatum*) was also detected. This species was recently delisted by both the USFWS and the State of California as an Endangered species, but it is still considered a State Fully Protected species. CNDDB forms are found in Attachment C for the arroyo toad and two-striped garter snake sightings, but no forms are included for the avian species as the sightings were brief and it is unknown whether these species were breeding in or near the survey area.

BonTerra Consulting appreciates the opportunity to assist with this project. Please contact David Hughes or Sam Stewart at (626) 351-2000 with any questions or comments.

Sincerely,

BONTERRA CONSULTING

David T. Hughes
Senior Project Manager

Samuel C. Stewart, IV
Project Manager

Enclosures: Exhibits 1, 2, and 3
Attachment A – Photographs
Attachment B –Wildlife Compendium
Attachment C – CNDDB Forms

cc: Kavita Mahulikar, Los Angeles County Department of Public Works
Ryan Butler, Los Angeles County Department of Public Works

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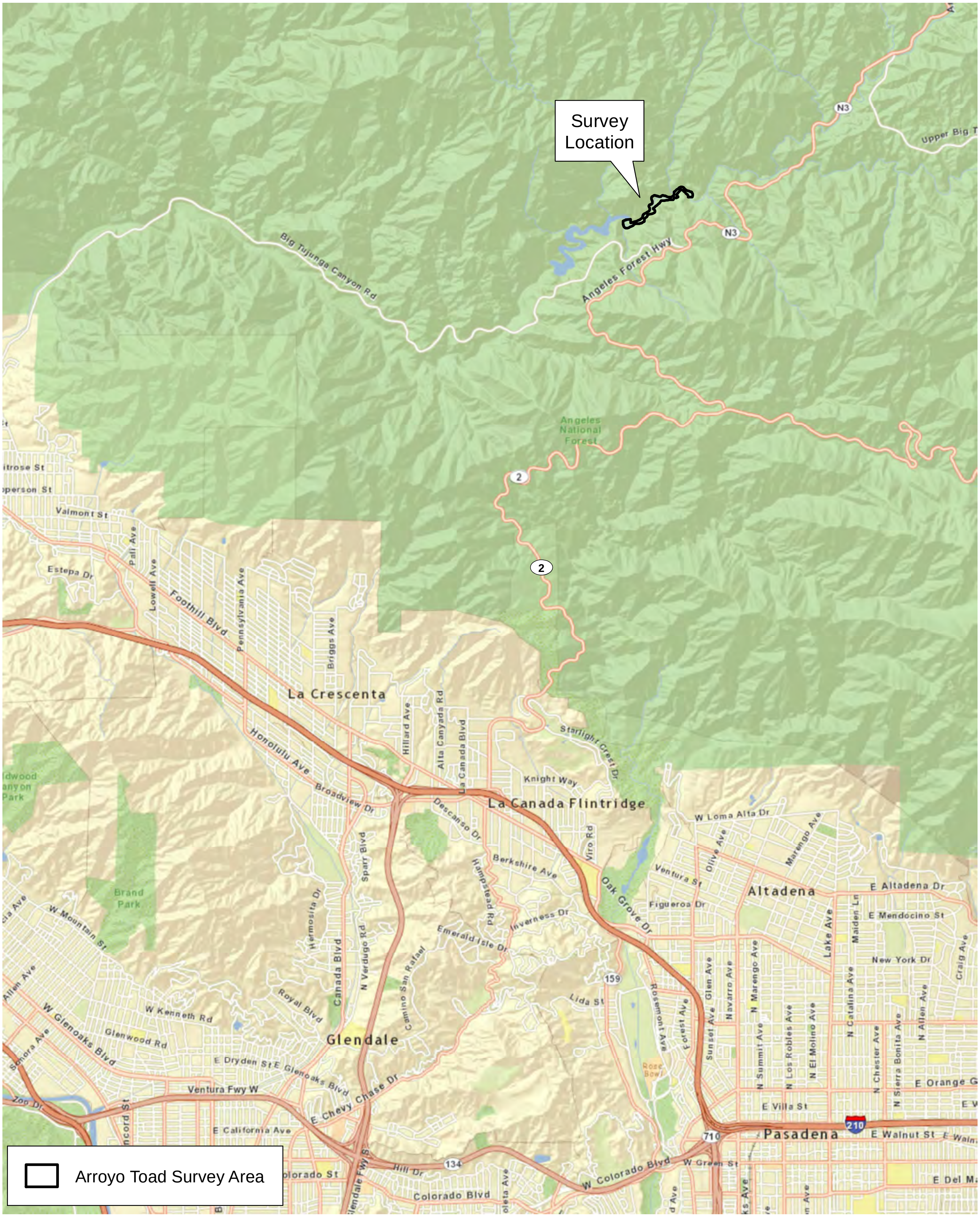

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Local Vicinity

Exhibit 1

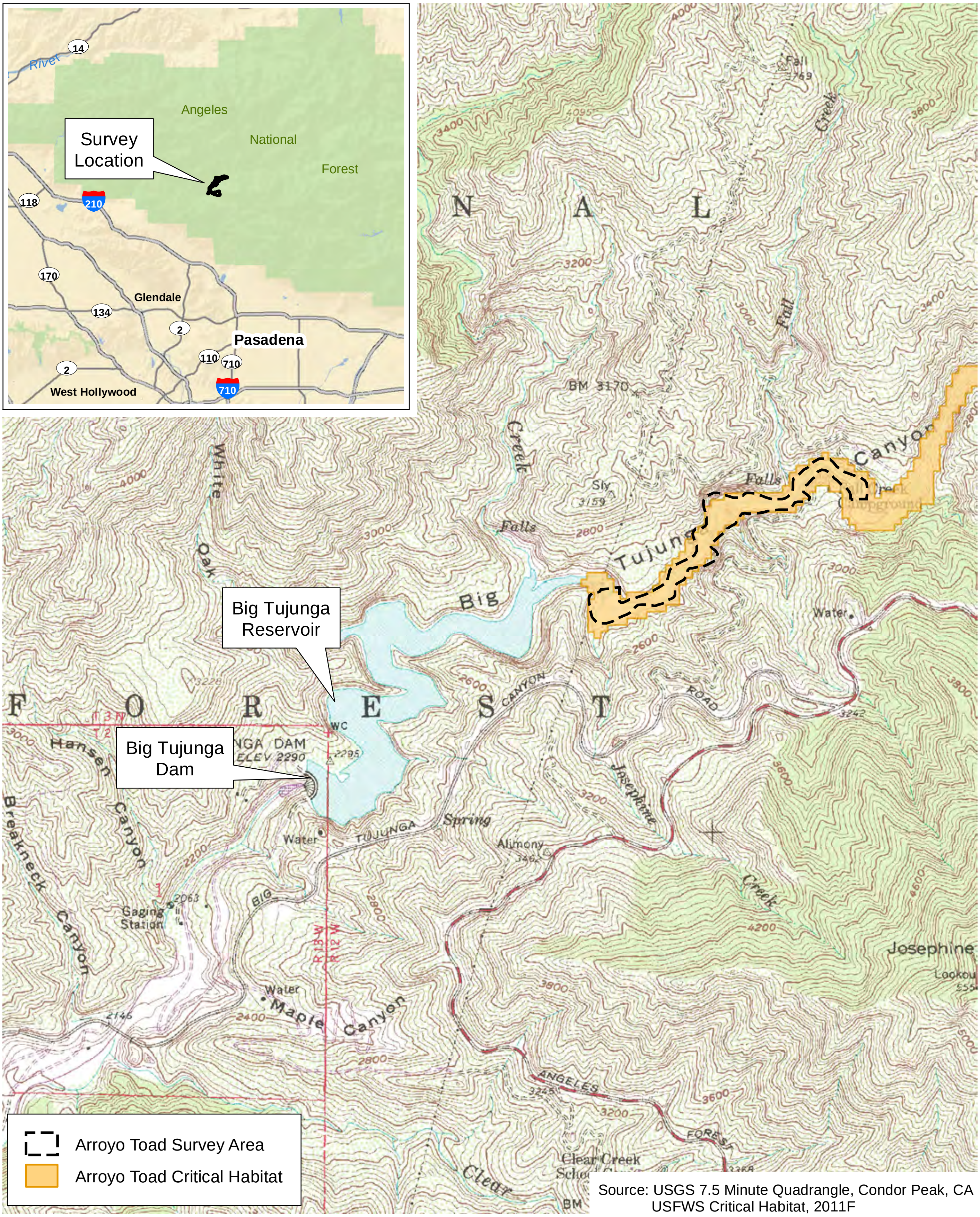
Big Tujunga Reservoir Sediment Removal Project

N W E S

8,000 4,000 0 8,000 Feet

BonTerra CONSULTING

(Rev: 10-10-2011 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\ARTO\Ex1_LV.pdf



Source: USGS 7.5 Minute Quadrangle, Condor Peak, CA
USFWS Critical Habitat, 2011F

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Arroyo Toad Survey Area

Exhibit 2

Big Tujunga Reservoir Sediment Removal Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

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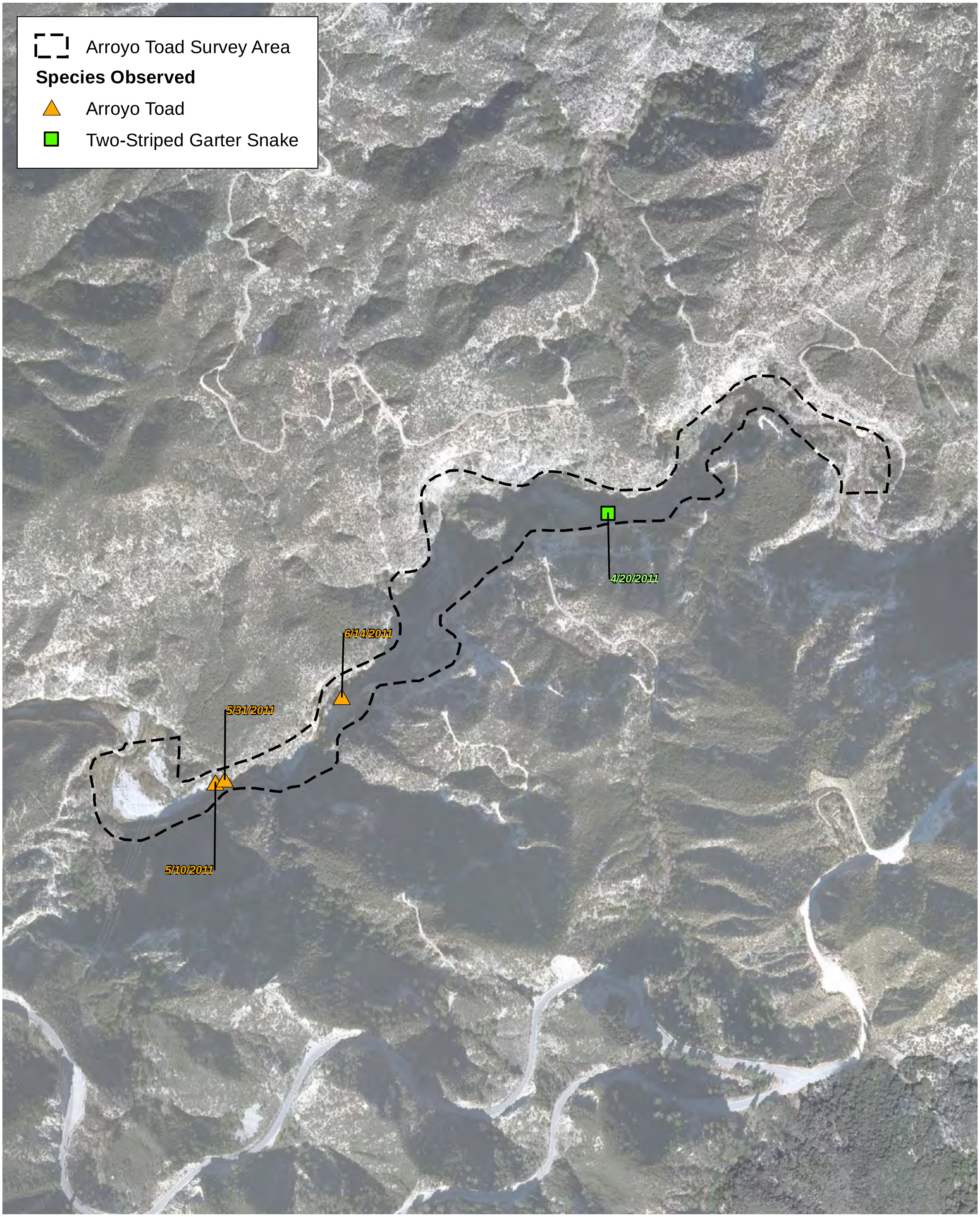

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Arroyo Toad Focused Survey Results

Exhibit 3

Big Tujunga Reservoir Sediment Removal Project

N W E S

700 350 0 700 Feet

BonTerra CONSULTING

(Rev: 10-10-2011 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\ARTO\Ex3_SurveyResults.pdf

ATTACHMENT A

PHOTOGRAPHS

Central portion of survey area facing upstream (April 20, 2011).

Western end of survey area facing downstream toward Big Tujunga Reservoir (April 20, 2011).

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Survey Area Photographs

Exhibit A-1

Big Tujunga Reservoir Sediment Removal Project

BonTerra CONSULTING

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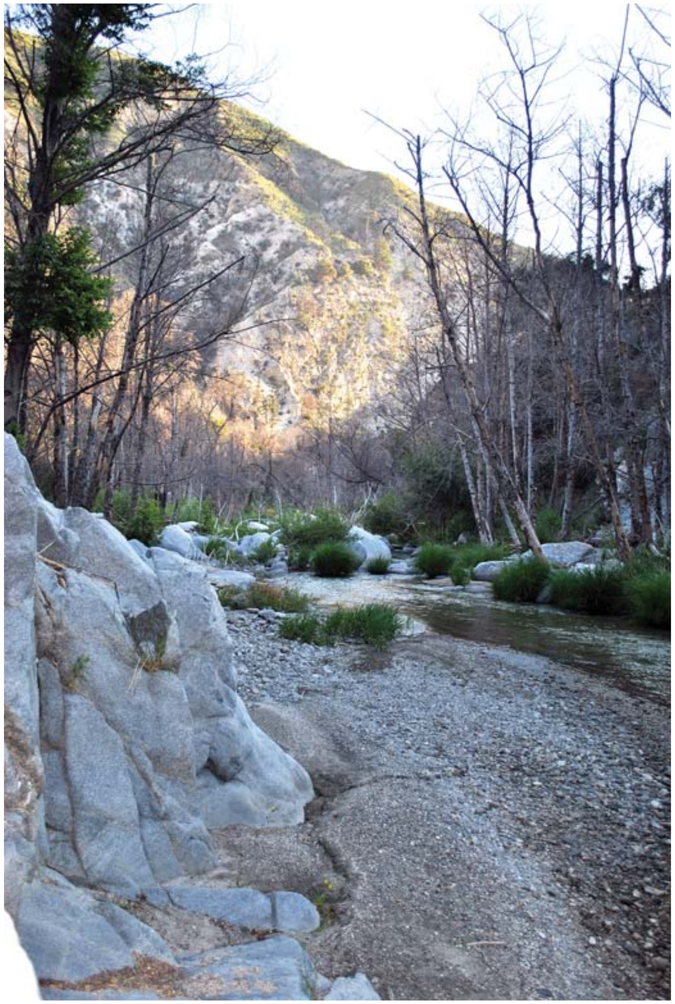
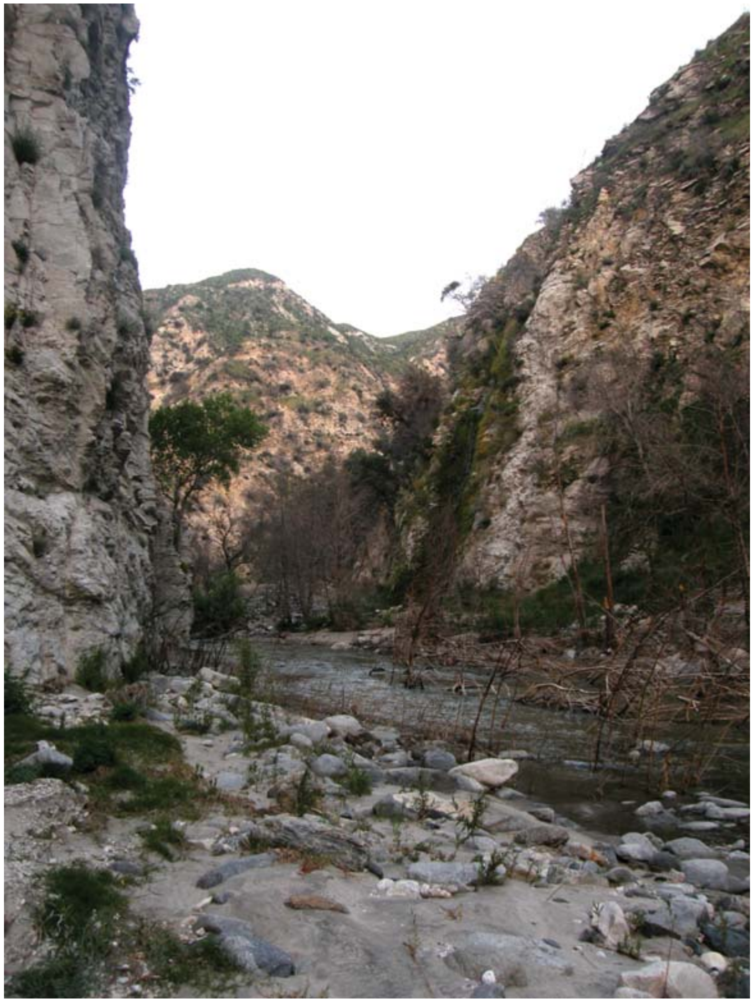


Eastern end of survey area facing downstream (June 14, 2011).



Western end of survey area facing upstream (April 20, 2011). Location of May 10 and 31, 2011 arroyo toad observations in foreground.

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Survey Area Photographs

Exhibit A-2

Big Tujunga Reservoir Sediment Removal Project

BonTerra CONSULTING

(Rev 10/10/11 JCD) PAS\Projects\CoLADPW\J162\Graphics\Bio\ARTO\ExA-2_photosB.pdf

Male arroyo toad observed in Big Tujunga Creek survey area on May 10, 2011

Male arroyo toad observed in Big Tujunga Creek survey area on May 31, 2011

Male arroyo toad photographed beneath the water surface in Big Tujunga Creek survey area on June 14, 2011

Note: These photographs are provided to illustrate the identical pattern and black pigmentation on the dorsum of the toad observed on May 10th, 31st and June 14th 2011, presumed to be the same individual. The variation in the overall coloration of the toad is due to physiological activation of chromatophores in the skin to better camouflage the toad against the variable substrate, as well as differences in light and aspect during photography.

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Arroyo Toad Photographs

Exhibit A-3

Big Tujunga Reservoir Sediment Removal Project

BonTerra CONSULTING

(Rev 10/10/11 JCD) PAS\Projects\CoLADPW\J162\Graphics\Bio\ARTO\ExA-3_photosC.pdf

ATTACHMENT B

WILDLIFE COMPENDIUM

WILDLIFE COMPENDIUM

Species
Amphibians
BUFONIDAE - TRUE TOADS
Anaxyrus boreas [*Bufo boreas*] western toad
Anaxyrus californicus [*Bufo microscaphus californicus*] arroyo toad
HYLIDAE - TREEFROGS
Pseudacris [Hyla] cadaverina California treefrog
Pseudacris hypochondriaca [*Hyla regilla*] Baja California treefrog
Reptiles
PHRYNOSOMATIDAE - ZEBRA-TAILED, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, & HORNED LIZARDS
Sceloporus occidentalis western fence lizard
Uta stansburiana side-blotched lizard
SCINCIDAE - SKINKS
Plestidon [*Eumeces*] *skiltonianus* western skink
TEIIDAE - WHIPTAIL LIZARDS
Aspidoscelis [Cnemidophorus] tigris stejnegeri coastal western whiptail
ANGUIDAE - ALLIGATOR LIZARDS
Elgaria multicarinata southern alligator lizard
COLUBRIDAE - COLUBRID SNAKES
Thamnophis hammondii two-striped garter snake
Birds
ANATIDAE - WATERFOWL
Anas platyrhynchos mallard
PHALACROCORACIDAE - CORMORANTS
Phalacrocorax auritus double-crested cormorant
ARDEIDAE - HERONS, BITTERNS, & ALLIES
Ardea herodias great blue heron
Nycticorax nycticorax black-crowned night-heron
ACCIPITRIDAE - HAWKS, KITES, EAGLES, & ALLIES
Buteo jamaicensis red-tailed hawk

WILDLIFE COMPENDIUM (Continued)

Species
FALCONIDAE - FALCONS
Falco sparverius peregrine falcon
Falco peregrinus peregrine falcon
COLUMBIDAE - PIGEONS & DOVES
Streptopelia chinensis * spotted dove
Zenaida macroura mourning dove
CAPRIMULGIDAE - GOATSUCKERS
Phalaenoptilus nuttallii common poorwill
APODIDAE - SWIFTS
Aeronautes saxatalis white-throated swift
TROCHILIDAE - HUMMINGBIRDS
Archilochus alexandri black-chinned hummingbird
Calypte costae Costa's hummingbird
Selasphorus sasin Allen's hummingbird
PICIDAE - WOODPECKERS
Picoides nuttallii Nuttall's woodpecker
Colaptes auratus northern flicker
TYRANNIDAE - TYRANT FLYCATCHERS
Contopus sordidulus western wood-pewee
Empidonax hammondii Hammond's flycatcher
Empidonax difficilis Pacific-slope flycatcher
Sayornis nigricans black phoebe
Myiarchus cinerascens ash-throated flycatcher
VIREONIDAE - VIREOS
Vireo cassinii Cassin’s vireo
CORVIDAE - CROWS & JAYS
Aphelocoma californica western scrub-jay
Corvus brachyrhynchos American crow
Corvus corax common raven

WILDLIFE COMPENDIUM (Continued)

Species
Cyanocitta stelleri steller's jay
HIRUNDINIDAE - SWALLOWS
Tachycineta thalassina violet-green swallow
Stelgidopteryx serripennis northern rough-winged swallow
Petrochelidon pyrrhonota cliff swallow
Baeolophus inornatus oak titmouse
TROGLODYTIDAE - WRENS
Salpinctes obsoletus rock wren
Catherpes mexicanus canyon wren
Thryomanes bewickii Bewick's wren
CINCLIDAE - DIPPERS
Cinclus mexicanus American dipper
PTILOGONATIDAE - SILKY-FLYCATCHERS
Phainopepla nitens phainopepla
PARULIDAE - WARBLERS
Oreothlypis [*Vermivora*] *celata* orange-crowned warbler
Dendroica petechia yellow warbler
Dendroica coronata yellow-rumped warbler
Dendroica nigrescens black-throated gray warbler
Wilsonia pusilla Wilson's warbler
EMBERIZIDAE - SPARROWS & JUNCOS
Pipilo maculatus spotted towhee
Melozone [*Pipilo*] *crissalis* California towhee
Amphispiza belli sage sparrow
Melospiza melodia song sparrow
Junco hyemalis dark-eyed junco

WILDLIFE COMPENDIUM (Continued)

Species
CARDINALIDAE - CARDINALS & ALLIES
Pheucticus melanocephalus black-headed grosbeak
Passerina amoena lazuli bunting
ICTERIDAE - BLACKBIRDS
Molothrus ater brown-headed cowbird
Icterus bullockii Bullock's oriole
FRINGILLIDAE - FINCHES
Carpodacus mexicanus house finch
Spinus [Carduelis] psaltria lesser goldfinch
Spinus [Carduelis] lawrencei Lawrence's goldfinch
Spinus [Carduelis] tristis American goldfinch
Mammals
MURIDAE - MICE, RATS, & VOLES
Peromyscus maniculatus deer mouse
CANIDAE - WOLVES & FOXES
Urocyon cinereoargenteus gray fox
PROCYONIDAE - RACCOONS
Procyon lotor common raccoon
MUSTELIDAE - WEASELS, SKUNKS & OTTERS
Mephitis mephitis striped skunk
CERVIDAE - DEER
Odocoileus hemionus mule deer
* introduced species

ATTACHMENT C

CNDDB FORM

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 05/10/2011

For Office Use Only
Source Code ________ Quad Code ________
Elm Code ________ Occ. No. ________
EO Index No. ________ Map Index No. ________

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Anaxyrus californicus*

Common Name: arroyo toad

Species Found? ☑ Yes ☐ No ________ If not, why?

Total No. Individuals 1 Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? ________ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: ________ Number ________ Museum / Herbarium

Reporter: Sam Stewart

Address: 3452 E. Foothill Blvd., Ste 420
Pasadena, CA. 91107

E-mail Address: sstewart@bonterraconsulting.com

Phone: (626) 351-2000

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

1 # adults ____ # juveniles ____ # larvae ____ # egg masses ____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☑ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Los Angeles Landowner / Mgr.: US Forest Service

Quad Name: Condor Peak Elevation: 2,253ft.

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex Vista H

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy 10 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 11S 3922504, 3796172 (5/10/2011); 11S 392189, 3796167 (5/31/2011); 11S 11S 392392, 3796304 (6/14/2011)

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Arroyo toad observed on north bank of Big Tujunga Creek above reservoir on sandy terrace and later advertising from stream margin. Same individual observed on two subsequent visits (5/31 & 6/14 of 2011). No other individuals observed during focused surveys at this location or for at least 1 km upstream. Appears to be a solitary male. Willow and alder riparian woodland with mule fat on banks.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: No development in vicinity. Angeles National Forest.

Visible disturbances: None.

Threats: Introduced fish and amphibian species, including black bullhead and American bullfrog (as indicated by dam operator) in the reservoir.

Comments: Solitary male. No other adults, egg masses, tadpoles, or other evidence of successful breeding observed during surveys.

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): Stebbins 2003
- ☐ Compared with specimen housed at: ________
- ☐ Compared with photo / drawing in: ________
- ☐ By another person (name): ________
- ☐ Other: familiarity with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☑

May we obtain duplicates at our expense? yes ☑ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 04/20/2011

For Office Use Only
Source Code ______ Quad Code ______
Elm Code ______ Occ. No. ______
EO Index No. ______ Map Index No. ______

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Thamnophis hammondii

Common Name: two-striped garter snake

Species Found? ☑ Yes ☐ No ______ If not, why?

Total No. Individuals 1 Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? ______ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: Sam Stewart
Address: 3452 E. Foothill Blvd., Ste 420
Pasadena, CA. 91107
E-mail Address: sstewart@bonterraconsulting.com
Phone: (626) 351-2000

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

1 # adults ____ # juveniles ____ # larvae ____ # egg masses ____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☑ other

***Location Description* (please attach map AND/OR fill out your choice of coordinates, below)**

County: Los Angeles Landowner / Mgr.: US Forest Service

Quad Name: Condor Peak Elevation: 2,350ft.

T 3N R 12W Sec 32, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex Vista H

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy 10 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 11S 392819, 3796599

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Large adult (approximately 80 cm) two-striped garter snake observed on north bank of Big Tujunga Creek above reservoir on sandy terrace. Willow and alder riparian woodland .

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: No development in vicinity. Angeles National Forest.

Visible disturbances: None.

Threats: Introduced amphibian species, including American bullfrog (as indicated by dam operator) in the reservoir.

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): Stebbins 2003
- ☐ Compared with specimen housed at: ______
- ☐ Compared with photo / drawing in: ______
- ☐ By another person (name): ______
- ☐ Other: familiarity with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☑

May we obtain duplicates at our expense? yes ☑ no ☐

APPENDIX B-4

SIERRA MADRE YELLOW-LEGGED FROG SURVEY LETTER REPORT

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January 4, 2012

Ms. Erin M. McCarthy
Recovery Permit Coordinator
U.S. Fish and Wildlife Service
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

VIA EMAIL
erin_mccarthy@fws.gov

Subject: Results of Focused Presence/Absence Surveys for Sierra Madre Yellow-legged Frog for the Big Tujunga Reservoir Sediment Removal Project, Los Angeles County, California

Dear Ms. McCarthy:

This Letter Report presents the results of focused diurnal surveys to determine the presence or absence of the Sierra Madre yellow-legged frog (*Rana muscosa*) upstream of the Big Tujunga Reservoir for the Big Tujunga Reservoir Sediment Removal Project. A qualified Biologist with the necessary experience and a California Department of Fish and Game (CDFG) scientific collecting permit conducted the surveys.

Survey Area

The survey area for the Big Tujunga Dam and Reservoir Sediment Removal Project is located in Big Tujunga Canyon on the southern edge of the San Gabriel Mountains, within the Angeles National Forest (ANF), Los Angeles County (Exhibit 1). The Sierra Madre yellow-legged frog survey area included suitable and accessible habitat along Big Tujunga Creek extending approximately 3,300 feet (one kilometer) upstream of Big Tujunga Reservoir and portions of three tributary creeks, including approximately 800 feet (0.24 kilometers) of Josephine Creek, 3,300 feet (one kilometer) of Fox Creek, and 1,300 feet (0.40 kilometers) of White Oak Creek (Exhibit 2). The remaining portions of Josephine and White Oak creeks were not surveyed due to the presence of an impassable physical obstacle (such as a waterfall) or lack of suitable upstream habitat. Representative photographs of the survey area are provided in Attachment A.

The survey area is located on the U.S. Geological Survey's (USGS') Condor Peak 7.5-minute topographic quadrangle at Township 3 North, Range 12 West, within Sections 31 and 32. Topography in the survey area consists of sheer cliffs and steep slopes to the canyon bottom, with elevations ranging from approximately 2,150 to 3,400 feet above mean sea level (msl). The survey area and surrounding vicinity consists of natural open space within the Angeles National Forest.

Big Tujunga Creek

Big Tujunga Creek flows in a westerly direction, and several tributaries from the north and south join it upstream of Big Tujunga Reservoir, including Josephine Creek to the south, and Fox Creek and White Oak Creek to the north. Big Tujunga Canyon is characterized by very steep slopes, shallow soils, and watercourses contained within bedrock channels. Erosion has deposited alluvium (including boulders, cobbles, gravels, and coarse to fine sandy soils) within the stream course. Topography is irregular, and stream grade and flow velocity range across a moderate spectrum. Stream morphology includes portions with narrow, incised, fast-moving streams with plunge pools; wider, slow-moving streams; and a relatively broad alluvial wash with multiple meanders where the creek flows into the reservoir. Within the survey area, Big Tujunga Creek is a perennially flowing stream.

Upstream of the reservoir, vegetation along Big Tujunga Creek consists primarily of southern riparian scrub species. Big Tujunga Canyon burned during the 2009 Station Fire; thus, the riparian canopy is sparse through much of the creek. The average vegetation heights are approximately five to seven feet. Vegetation within Big Tujunga Creek consists mainly of willow riparian scrub dominated by arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*); however, in some areas it is co-dominated by white alder (*Alnus rhombifolia*) and Fremont cottonwood (*Populus fremontii* ssp. *fremontii*). Other common species present include mule fat (*Baccharis salicifolia*), stinging nettle (*Urtica dioica*), and mugwort (*Artemisia douglasiana*). In upland areas, coast live oaks (*Quercus agrifolia*) and western sycamores (*Platanus racemosa*) are also present.

In alluvial terraces and slopes above the main stream course, alluvial scrub is present, dominated by scale-broom (*Lepidospartum squamatum*); other common species include thick-leaf yerba santa (*Eriodictyon crassifolium*), California buckwheat (*Eriogonum fasciculatum*), Our Lord's candle (*Yucca whipplei*), black sage (*Salvia mellifera*), deerweed (*Acmispon glaber* [*Lotus scoparius*]), and laurel sumac (*Malosma laurina*). Many of the burned trees and shrubs are resprouting from the base. Poodledog bush (*Turricula parryi*), a fire-following species, is widespread throughout the survey area.

Josephine Creek

Josephine Creek flows from the south into Big Tujunga Creek at its confluence with Big Tujunga Reservoir. Stream morphology during surveys is best characterized as a shallow, narrow creek, less than 2 feet (0.6 meter) deep and 10 feet (3.0 meters) wide, and a moderate stream grade within a steep sided canyon approximately 200 feet (61 meters) wide. Approximately 800 feet (0.24 kilometer) upstream of the confluence with Big Tujunga Creek, Josephine Creek flows into the canyon over an approximately 140 foot (43 meter) vertical waterfall. Substrate within the canyon consists of boulders, cobble, gravel, and coarse sand.

Vegetation within Josephine Creek consists mainly of southern sycamore alder riparian woodland, dominated by white alder and western sycamore. In some areas it is co-dominated by black willow (*Salix goddingii*) with a few coast live oak scattered throughout. This vegetation type burned during the 2009 Station Fire and the understory has grown thick with stinging nettle, mugwort, caterpillar phacelia (*Phacelia cicutaria*), scarlet monkeyflower (*Mimulus cardinalis*), California blackberry (*Rubus ursinus*), and poodledog bush. Trees that survived the fire are resprouting.

Fox Creek

Fox Creek flows from the north into Big Tujunga Reservoir approximately half a mile (0.8 kilometer) west of Josephine Creek. Stream morphology during surveys is best characterized as a shallow, narrow creek, less than 3 feet (0.9 meter) deep and 15 feet (4.5 meter) wide, and a moderate stream grade within a steep-sided canyon less than 100 feet (30 meters) wide. Approximately 1,200 feet (0.37 kilometer) upstream of the confluence with Big Tujunga Creek, Fox Creek flows into the canyon over an approximately 70 foot (21 meter) vertical waterfall. Above the waterfall, the canyon becomes narrower with granite slides and sandy pools up to 6 feet (1.8 meter) deep. Substrate within the canyon consists of boulders, cobble, gravel, and coarse to very fine-grained sand.

Vegetation within Fox Creek consists of relatively sparse southern sycamore alder riparian woodland, dominated by white alder and western sycamore. In some areas it is co-dominated by black willow and Fremont cottonwood with coast live oak scattered throughout the upper terraces. Portions of this vegetation type burned during the 2009 Station Fire. The understory consists of patches of caterpillar phacelia, scarlet monkeyflower, California blackberry, and poodledog bush.

White Oak Creek

White Oak Creek flows from the north into Big Tujunga Reservoir approximately 0.5-mile west of the confluence of Fox Creek and Big Tujunga Creek. Stream morphology during surveys is best characterized as a shallow, narrow creek, less than 2 feet (0.6 meter) deep and 5 feet (1.5 meter) wide, and a moderate stream grade within a near vertical walled canyon less than 100 feet (30 meters) wide. The creek has eroded a steep sided channel through sedimentary deposits primarily composed of coarse to fine grained sand and silt. Approximately 1,300 feet (0.4 kilometers) upstream of the confluence with Big Tujunga Creek, White Oak Creek flows into the canyon over an approximately 120 foot (37 meter) vertical waterfall. Above the waterfall, the canyon becomes narrower with a very steep stream gradient.

Vegetation within White Oak Creek consists of sparse willow riparian scrub dominated by black willow with scattered Fremont cottonwood. The alluvial deposits are primarily devoid of vegetation and appear deep, likely having been deposited following the 2009 Station Fire.

Background Information

The Sierra Madre yellow-legged frog was federally listed as an Endangered species by the U.S. Fish and Wildlife Service (USFWS) on July 2, 2002, and is considered a CDFG Species of Special Concern. This species has been extirpated from more than 90 percent of its historic range (Knapp et al. 2007). At the time of listing, the Sierra Madre and the Sierra Nevada (*R. sierrae*) yellow-legged frogs were considered distinct population segments of *R. muscosa*. Genetic, morphological, and acoustical studies (Vredenburg et al. 2007) have determined that they are genetically distinct and the Sierra Nevada yellow-legged frog (*R. sierra*) is now recognized as a new species. The northern distribution of the Sierra Madre yellow-legged frog occurs on the western slopes of the Sierra Nevada Mountains from Fresno County south to Kern County, with Mather Pass representing the northern border of the species range (Vredenburg et al. 2007). The Sierra Nevada yellow-legged frog occurs north of Mather Pass on the eastern slopes of the Sierra Nevada Mountains. The southern distribution of the Sierra Madre yellow-legged frog consists of several small, isolated populations in the San Gabriel, San Bernardino, and San Jacinto Mountains, the largest of which does not exceed 100 individuals. Only the Sierra Madre yellow-legged frog is known to occur in the project region.

The Sierra Madre yellow-legged frog ranges in size from 1.5 to 3.25 inches (3.8 to 8.3 centimeters) snout to vent length (Jennings and Hayes 1994a). Females average slightly larger than males (Stebbins 2003). The belly and ventral (bottom) surface of the hind limbs are yellow to orange, with this pigmentation on the abdomen occasionally extending to the forelimbs (Stebbins 2003). Dorsal (top) coloration in adults is variable, exhibiting a mix of brown and yellow, but it can also be gray, red, or green-brown, and usually patterned with dark spots (Jennings and Hayes 1994a). Dorsolateral (horizontal along the body) folds are apparent but not as pronounced as the red-legged frog. Tadpoles can reach lengths of 2.8 inches (7 centimeters) and are generally mottled brown in dorsal coloration with a golden tint and faintly yellow ventral coloration (Stebbins 2003).

Within the southern range of the Sierra Madre yellow-legged frog in the San Gabriel, San Bernardino, and San Jacinto Mountains, this species is found in narrow, rock-walled rivers, perennial creeks, permanent plunge pools within intermittent creeks, and pools in montane riparian and/or chaparral habitat from 1,200 to 7,500 feet (365 to 2286 meters) msl (Jennings and Hayes 1994a). Breeding pools must maintain water during the entire tadpole growth phase which can last up to four years. Substrates within the aquatic habitat consist of varying proportions of silt, sand, gravel, cobble, rock, and boulders. Boulders and open gravel banks projecting above the water level are required for sunning. Aquatic refugia, including pools with overhanging banks, fallen logs, or rocks, are required to escape predation.

Sierra Madre yellow-legged frogs are primarily diurnal and maintain a small home range, likely less than 33 feet (10 meters) in the longest dimension (CDFG 2008). They are also highly aquatic, not venturing more than a few feet (one meter) from water (CDFG 2008). Adults feed primarily on aquatic and terrestrial invertebrates, favoring terrestrial insects, but have also been observed feeding on tadpoles (Mullally 1953; Heller 1960). Yellow-legged frog tadpoles graze on algae and diatoms along rocky bottoms in shallows.

During the breeding season, typically from March to May, males will defend a territory and make advertising vocalizations to females from shallow areas along the creek margins. Calls are made above and below the water's surface. This species lacks vocal sacs and vocalizations are therefore weak and difficult to detect. Small egg masses of 15 to 350 eggs are deposited underwater where they attach to rocks, gravel, vegetation, or under banks (Livezey and Wright 1945). Eggs hatch approximately three weeks later (Zweifel 1955). Length of the larval stage has not been studied for the southern populations of the Sierra Madre yellow-legged frog; however, it has been determined to be dependent upon elevation in Sierra Nevada yellow-legged frog. Larval stage length for Sierra Nevada yellow-legged frog was found to range from 4 years for the highest elevation populations to one year for the lowest elevation populations (Storer 1925; Zweifel 1955). Larval stage lengths for Sierra Madre yellow-legged frog would be expected to conform to lower elevation Sierra Nevada yellow-legged frog populations. Females reach sexual maturity at 1.8 inches (4.6 centimeters) with males maturing at a slightly smaller size (Zweifel 1955). There is little reliable data on age at sexual maturity but it is considered to be at least three years after metamorphosis (Zweifel 1955).

On September 13, 2005, the USFWS proposed a rule designating approximately 8,770 acres (3550 hectares) of land as critical habitat for the Southern California Distinct Vertebrate Population Segment of the Mountain Yellow-Legged Frog (*Rana muscosa*) in Los Angeles, San Bernardino, and Riverside counties, California (USFWS 2005). A final rule was published on September 14, 2006 for approximately 8,283 acres (3352 hectares) (USFWS 2006). The nearest Critical Habitat is Unit 1D, Devil's Canyon, approximately 12 miles (19 kilometers) east of the project area within the San Gabriel River Watershed. The survey area is located in the Los Angeles River Watershed.

The Sierra Madre yellow-legged frog occurred historically in the Big Tujunga Wash immediately upstream of Foothill Boulevard; and in Big Tujunga Creek, Mill Creek, and several tributary drainages above Big Tujunga Dam (CDFG 2011). There have been no documented observations of the population between Foothill Boulevard and Big Tujunga Dam since 1939 and it is considered extirpated (CDFG 2011; Jennings and Hayes 1994b). The closest known population for this species is located at Devil's Canyon approximately 12 miles (19 kilometers) east.

The San Diego Zoo's Institute for Conservation Research, in conjunction with the CDFG, USFWS, U.S. Forest Service (USFS) and USGS, has developed a Mountain Yellow-legged Frog Recovery Program which involves captive breeding and translocation for the remaining frogs from the San Bernardino Mountains (San Diego Zoo 2009). In August of 2006, 75 tadpoles were collected from a drying stream bed in the San Jacinto Mountains and were used to establish the captive breeding program. In 2010, tadpole offspring from the captive breeding program were released back into the San Jacinto Mountains at sites where the species was observed historically.

Survey Methodology

Prior to conducting the focused surveys, a search of the California Natural Diversity Database (CNDDB) (CDFG 2011) and other relevant available documents (Jennings and Hayes 1994; Campbell et al. 1996) was conducted to determine if and to what extent the Sierra Madre yellow-legged frog occurs in the project vicinity.

An initial site assessment was conducted by BonTerra Consulting Senior Herpetologist Sam Stewart on March 17, 2011, to determine the extent of potentially suitable habitat for the Sierra Madre yellow-legged frog. The site assessment determined that Big Tujunga Creek upstream from the reservoir and three tributary drainages (i.e., Josephine Creek, Fox Creek, and White Oak Creek) provide potentially suitable habitat for the species.

Surveys were proposed in suitable habitat up to 0.6 mile (1 kilometer) from the project study area, which includes Big Tujunga Reservoir and a 200 foot (60 meter) buffer. Surveys in Big Tujunga Creek were conducted from the reservoir to the Fall Creek Campground/USFS Road 3N27 approximately 0.6 mile (one kilometer) upstream. Surveys in Fox Canyon were conducted from Big Tujunga Creek to approximately 0.6 mile (1 kilometer upstream). The Josephine Creek survey area was reduced to 800 feet (244 meters) from the confluence with Big Tujunga Creek due to the presence of an impassable 140 foot (43 meter) vertical waterfall and marginal conditions for the species (i.e., relatively broad canyon and lack of suitable pools for larval development). The White Oak Creek survey area was reduced to 1,200 feet (365 meters) from the confluence with Big Tujunga Creek due to the presence of an impassable 120 foot (37 meter) vertical waterfall and lack of suitable upstream habitat (i.e., high stream gradient).

Mr. Stewart was the principal investigator accompanied by BonTerra Consulting Biologist Jason Mintzer. A total of four diurnal surveys were conducted on July 28; August 2, 15, and 17, 2011. The timing of the surveys was not suitable to observe breeding but adults and larvae would have been detectable. Although there is no USFWS-approved survey protocol for the Sierra Madre yellow-legged frog, surveys were consistent with a draft survey protocol developed by the USGS (Backlin et al. 2003).

Diurnal surveys were conducted between 9:00 AM and dusk, and focused on the detection of frogs by visual identification and checking potentially suitable breeding habitat for tadpoles. Mr. Stewart and Mr. Mintzer scanned pools for larvae, juveniles, and adults in potentially suitable breeding territories along the stream, and for foraging individuals in the adjacent riparian areas. Surveys were conducted during appropriate environmental conditions conducive to the activity patterns of the Sierra Madre yellow-legged frog. Generally, these conditions consist of temperatures in excess of 50 degrees Fahrenheit (10 degrees Celsius) with low winds (less than 10 miles [16 kilometers] per hour). Survey dates, times, and weather data are shown in Table 1.

TABLE 1
SUMMARY OF SIERRA MADRE YELLOW LEGGED FROG SURVEY CONDITIONS

Survey	Surveying Biologists	Survey Date	Wind (miles/hour)		Temperature (°F)		Relative Humidity (%)		Cloud Cover
			Start	End	Start	End	Start	End	
1	S. Stewart, J. Mintzer	7/28/2011	4-6	0-2	77	78	45	44	Clear
2	S. Stewart, J. Mintzer	8/2/2011	3-5	2-4	88	89	20	17	10%
3	S. Stewart, J. Mintzer	8/15/2011	0-2	5-7	82	84	21	34	Clear
4	S. Stewart, J. Mintzer	8/17/2011	0-2	2-4	83	88	22	20	10%

Special status species detected during surveys were documented in field notes and the following data collected whenever possible: (1) time of initial observation; (2) meteorological conditions at time of initial observation (including temperature, relative humidity, wind speed, and barometric pressure); (3) geographic positioning system (GPS) coordinates; (4) and photographs.

Survey Results

No Sierra Madre yellow-legged frogs were observed during focused surveys. Native amphibian species observed during surveys include western toad (*Anaxyrus boreas*), California treefrog (*Pseudacris cadaverina*), and Baja California treefrog (*Pseudacris hypochondriac*). A list of all wildlife species observed within the survey area is included in Attachment B.

Several non-target special status species were observed during surveys (Table 2). These include the following California Species of Special Concern: yellow warbler (*Dendroica petechia*),loggerhead shrike (*Lanius ludovicianus*), and two-striped garter snake (*Thamnophis hammondii*). The coastal whiptail (*Aspidoscelis tigris stejnegeri*), a CDFG Special Animal, and peregrine falcon (*Falco peregrines*), a California Fully Protected Species, were also detected. CNDDB forms for these species are found in Attachment C. Detailed information on the special status bird sightings was not collected because amphibians were the focus of the survey effort. Therefore, CNDDB forms for special status bird species are not included in Attachment C.

TABLE 2
SPECIAL STATUS SPECIES OBSERVED DURING SURVEYS

Scientific Name	Common Name	Status			Location
		USFWS	USFS	CDFG	
Reptiles					
Aspidoscelis tigris stejnegeri	coastal whiptail	-	-	SA	All segments
Thamnophis hammondii	two-striped garter snake	-	FSS	SSC	Big Tujunga Creek, Fox Creek
Birds					
Dendroica petechia	yellow warbler	-	-	SSC	Big Tujunga Creek
Falco peregrines	peregrine falcon	-	FSS	CFP SCD	Big Tujunga Creek
Lanius ludovicianus	loggerhead shrike	-	-	SSC	Fox Creek

Federal Designations (USFS)
FSS Forest Service Sensitive Species

State Designations (CDFG)
CFP California Fully Protected
SA Special Animal
SCD California (State) Candidate for Delisting
SSC Species of Special Concern

BonTerra Consulting appreciates the opportunity to assist with this project. Please contact David Hughes or Sam Stewart at (626) 351-2000 with any questions or comments.

Sincerely,

BONTERRA CONSULTING

David T. Hughes
Senior Project Manager

for Samuel C. Stewart, IV
Senior Herpetologist

Enclosures: Exhibits 1 and 2
Attachment A – Site Photographs
Attachment B –Wildlife Compendium
Attachment C – CNDDB Forms

cc: Ryan Butler, Los Angeles County Department of Public Works
Philip Siongco, Los Angeles County Department of Public Works

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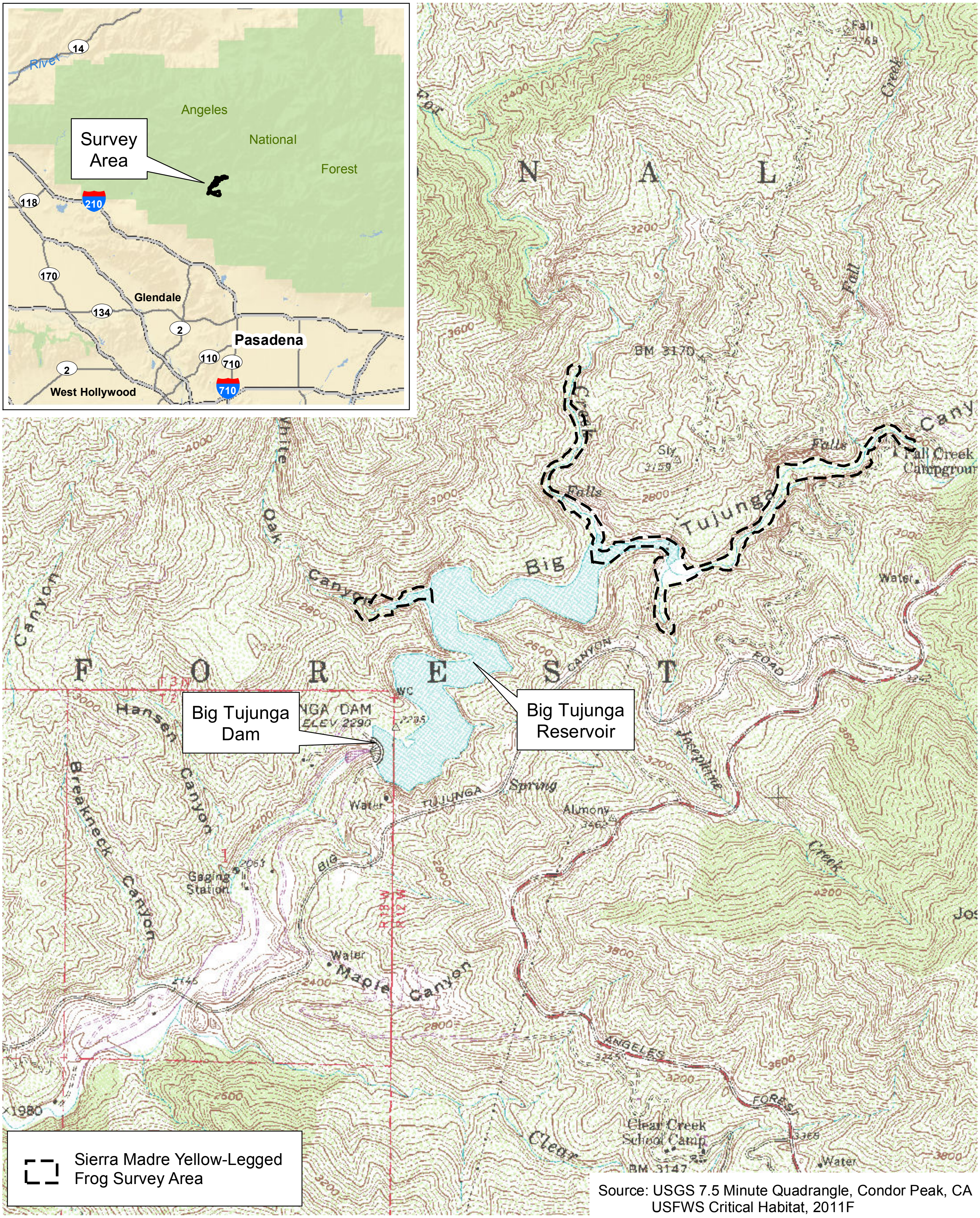

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Survey Area Location

Exhibit 1

Sierra Madre Yellow-Legged Frog Survey for the Big Tujunga Reservoir Sediment Removal Project

N W E S

2,000 1,000 0 2,000 Feet

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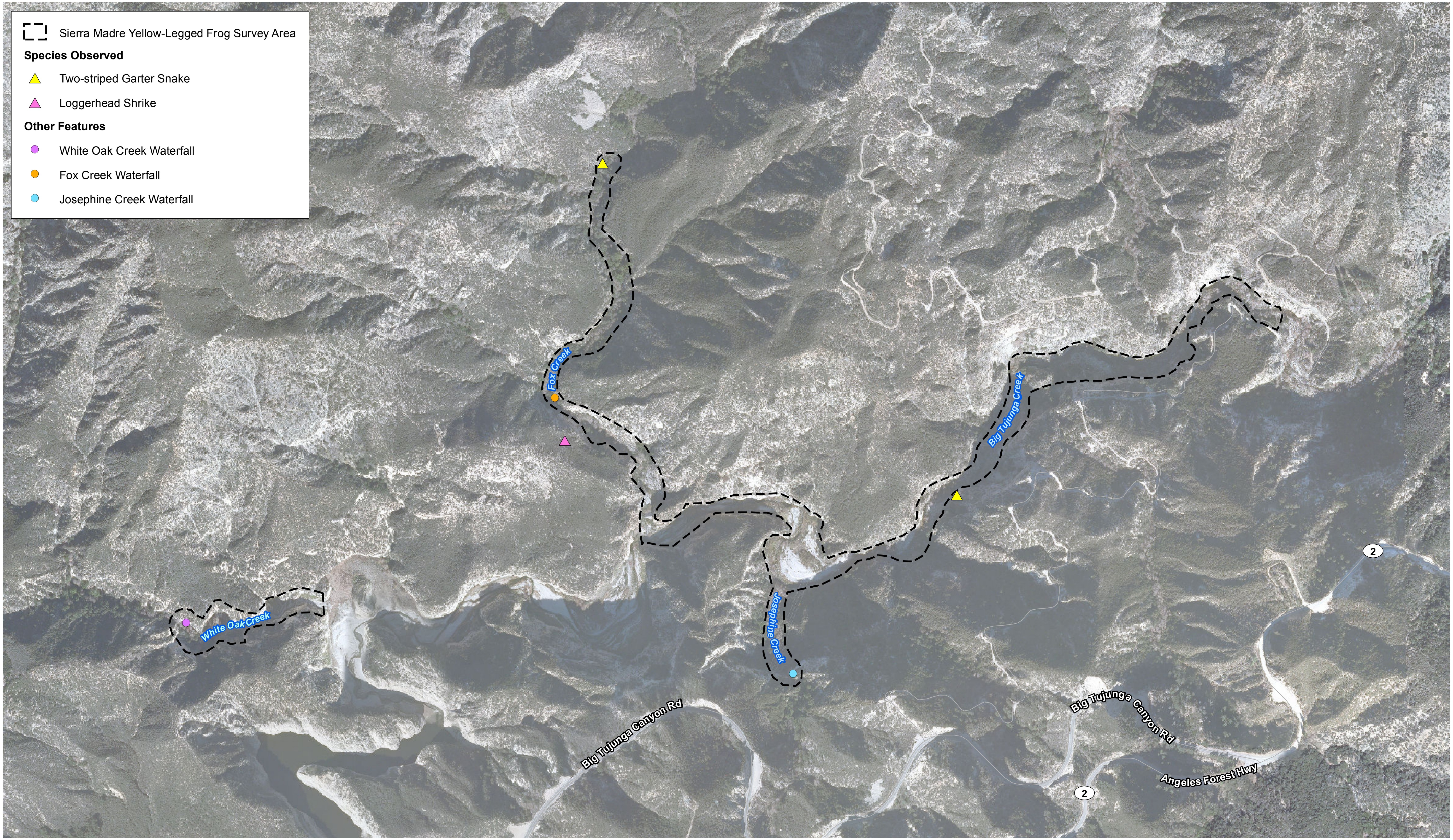

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Sierra Madre Yellow-Legged Frog Survey Area

Exhibit 2

Sierra Madre Yellow-Legged Frog Survey for the Big Tujunga Reservoir Sediment Removal Project

N W E S

700 350 0 700
Feet

BonTerra CONSULTING

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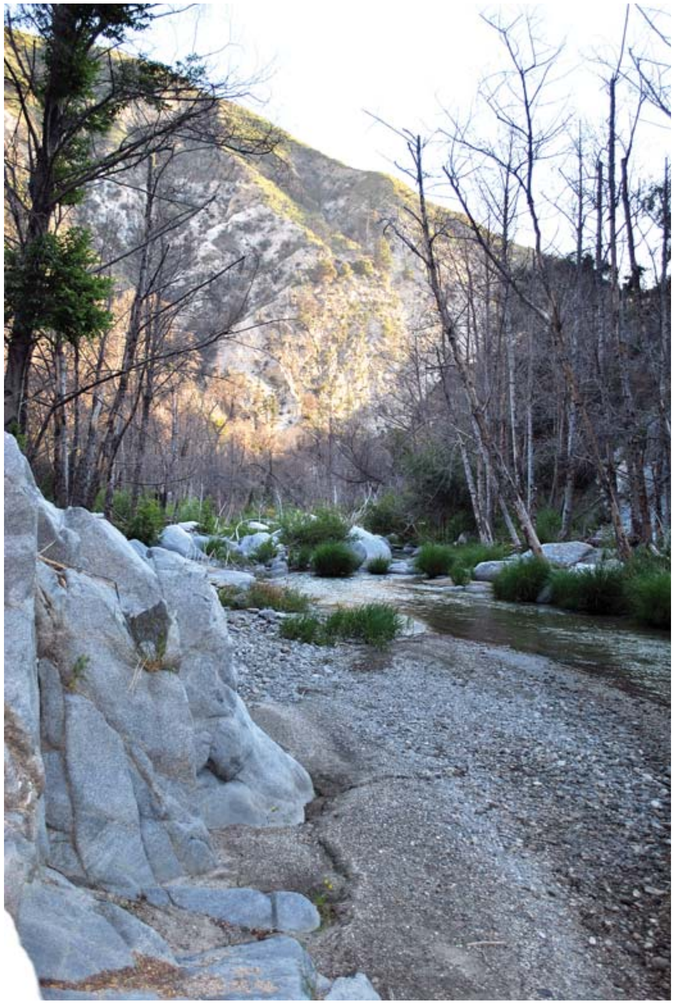
ATTACHMENT A

PHOTOGRAPHS



Eastern end of Big Tujunga Creek survey area facing downstream.

Fox Creek Waterfall.

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Survey Area Photographs

Attachment A-1

Sierra Madre Yellow-Legged Frog Survey for the Big Tujunga Reservoir Sediment Removal Project

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Fox Canyon granite slides and pools above the waterfall.

White Oak Canyon facing downstream toward Big Tujunga Reservoir.

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Survey Area Photographs

Attachment A-2

Sierra Madre Yellow-Legged Frog Survey for the Big Tujunga Reservoir Sediment Removal Project

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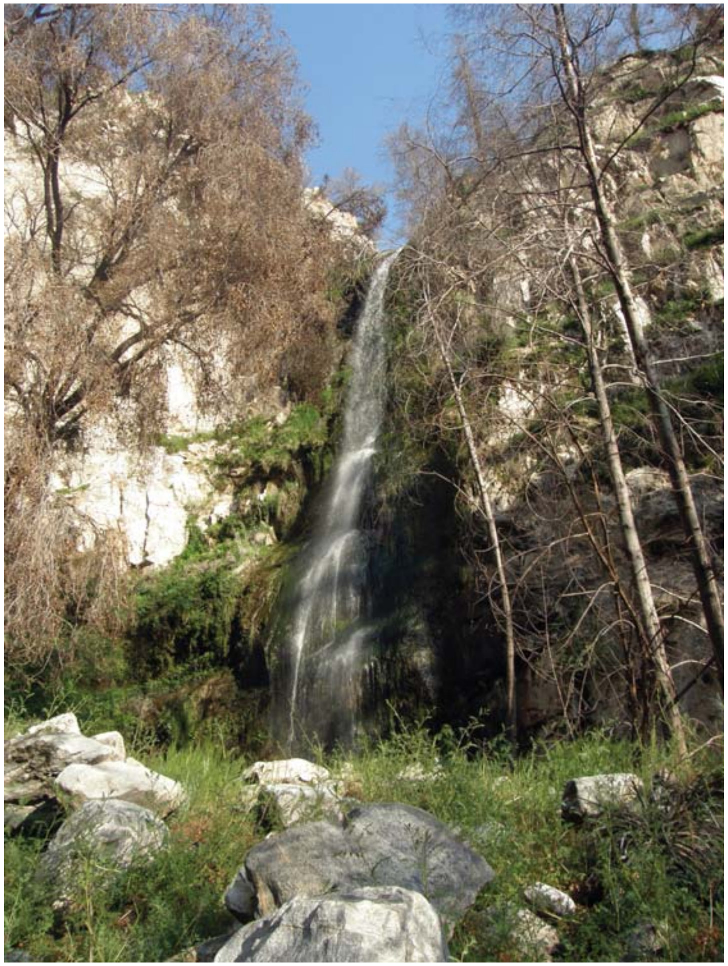
(Rev: 01-04-12 JCD) PAS\Projects\CoLADPW\J162\Graphics\Bio\SMYF_Report\AttA_2.pdf



Josephine Creek Waterfall.

Representative habitat within Fox Canyon.

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Survey Area Photographs

Attachment A-3

Sierra Madre Yellow-Legged Frog Survey for the Big Tujunga Reservoir Sediment Removal Project

BonTerra CONSULTING

(Rev: 01-04-12 JCD) PAS\Projects\CoLADPW\J162\Graphics\Bio\SMYF_Report\AttA_3.pdf

ATTACHMENT B

WILDLIFE COMPENDIUM

WILDLIFE COMPENDIUM

Species
Amphibians
BUFONIDAE - TRUE TOADS
Anaxyrus boreas [*Bufo boreas*] western toad
HYLIDAE - TREEFROGS
Pseudacris [Hyla] cadaverina California treefrog
Pseudacris hypochondriaca [*Hyla regilla*] Baja California treefrog
Reptiles
PHRYNOSOMATIDAE - ZEBRA-TAILED, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, & HORNED LIZARDS
Sceloporus occidentalis western fence lizard
Uta stansburiana side-blotched lizard
SCINCIDAE - SKINKS
Plestidon [*Eumeces*] *skiltonianus* western skink
TEIIDAE - WHIPTAIL LIZARDS
Aspidoscelis [Cnemidophorus] tigris stejnegeri coastal whiptail
ANGUIDAE - ALLIGATOR LIZARDS
Elgaria multicarinata southern alligator lizard
COLUBRIDAE - COLUBRID SNAKES
Thamnophis hammondii two-striped garter snake
Birds
ANATIDAE - WATERFOWL
Anas platyrhynchos mallard
PHALACROCORACIDAE - CORMORANTS
Phalacrocorax auritus double-crested cormorant
ARDEIDAE - HERONS, BITTERNS, & ALLIES
Ardea herodias great blue heron
Nycticorax nycticorax black-crowned night-heron
ACCIPITRIDAE - HAWKS, KITES, EAGLES, & ALLIES
Buteo jamaicensis red-tailed hawk
FALCONIDAE - FALCONS
Falco sparverius American kestrel
Falco peregrinus peregrine falcon

WILDLIFE COMPENDIUM (Continued)

Species
COLUMBIDAE - PIGEONS & DOVES
Streptopelia chinensis * spotted dove
Zenaida macroura mourning dove
CAPRIMULGIDAE - GOATSUCKERS
Phalaenoptilus nuttallii common poorwill
APODIDAE - SWIFTS
Aeronautes saxatalis white-throated swift
TROCHILIDAE - HUMMINGBIRDS
Archilochus alexandri black-chinned hummingbird
Calypte costae Costa's hummingbird
Selasphorus sasin Allen's hummingbird
PICIDAE - WOODPECKERS
Picoides nuttallii Nuttall's woodpecker
Colaptes auratus northern flicker
TYRANNIDAE - TYRANT FLYCATCHERS
Contopus sordidulus western wood-pewee
Empidonax hammondii Hammond's flycatcher
Empidonax difficilis Pacific-slope flycatcher
Sayornis nigricans black phoebe
Myiarchus cinerascens ash-throated flycatcher
VIREONIDAE - VIREOS
Vireo cassinii Cassin’s vireo
CORVIDAE - CROWS & JAYS
Aphelocoma californica western scrub-jay
Corvus brachyrhynchos American crow
Corvus corax common raven
Cyanocitta stelleri Steller's jay

WILDLIFE COMPENDIUM (Continued)

Species
HIRUNDINIDAE - SWALLOWS
Tachycineta thalassina violet-green swallow
Stelgidopteryx serripennis northern rough-winged swallow
Petrochelidon pyrrhonota cliff swallow
Baeolophus inornatus oak titmouse
TROGLODYTIDAE - WRENS
Salpinctes obsoletus rock wren
Catherpes mexicanus canyon wren
Thryomanes bewickii Bewick's wren
CINCLIDAE - DIPPERS
Cinclus mexicanus American dipper
PTILOGONATIDAE - SILKY-FLYCATCHERS
Phainopepla nitens phainopepla
PARULIDAE - WARBLERS
Oreothlypis [*Vermivora*] *celata* orange-crowned warbler
Dendroica petechia yellow warbler
Dendroica coronata yellow-rumped warbler
Dendroica nigrescens black-throated gray warbler
Wilsonia pusilla Wilson's warbler
EMBERIZIDAE - SPARROWS & JUNCOS
Pipilo maculatus spotted towhee
Melozone [*Pipilo*] *crissalis* California towhee
Amphispiza belli sage sparrow
Melospiza melodia song sparrow
Junco hyemalis dark-eyed junco
CARDINALIDAE - CARDINALS & ALLIES
Pheucticus melanocephalus black-headed grosbeak
Passerina amoena lazuli bunting

WILDLIFE COMPENDIUM (Continued)

Species
ICTERIDAE - BLACKBIRDS
Molothrus ater brown-headed cowbird
Icterus bullockii Bullock's oriole
FRINGILLIDAE - FINCHES
Carpodacus mexicanus house finch
Spinus [Carduelis] psaltria lesser goldfinch
Spinus [Carduelis] lawrencei Lawrence's goldfinch
Spinus [Carduelis] tristis American goldfinch
Mammals
MURIDAE - MICE, RATS, & VOLES
Peromyscus maniculatus deer mouse
CANIDAE - WOLVES & FOXES
Urocyon cinereoargenteus gray fox
PROCYONIDAE - RACCOONS
Procyon lotor common raccoon
MUSTELIDAE - WEASELS, SKUNKS & OTTERS
Mephitis mephitis striped skunk
CERVIDAE - DEER
Odocoileus hemionus mule deer
* introduced species

ATTACHMENT C

CNDDB FORM

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/15/2011

For Office Use Only

Source Code ______ Quad Code ______
Elm Code ______ Occ. No. ______
EO Index No. ______ Map Index No. ______

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Thamnophis hammondii*

Common Name: two-striped garter snake

Species Found? ☑ Yes ☐ No ______ If not, why?

Total No. Individuals 1 Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? ______ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: Sam Stewart

Address: 225 S. Lake Ave., Suite 1000
Pasadena, CA. 91101

E-mail Address: sstewart@bonterraconsulting.com

Phone: (626) 351-2000

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

1 # adults ____ # juveniles ____ # larvae ____ # egg masses ____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Los Angeles Landowner / Mgr.: US Forest Service

Quad Name: Condor Peak Elevation: 2,253ft.

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex Vista H

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy 10 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 11S 392434, 3796307

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Adult two-striped garter snake observed foraging on south bank of Big Tujunga Creek above reservoir on sandy terrace. Willow and alder riparian woodland with mule fat on banks.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: No development in vicinity. Angeles National Forest.

Visible disturbances: None.

Threats:

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): Powell et al. 1998
- ☐ Compared with specimen housed at: ______
- ☐ Compared with photo / drawing in: ______
- ☐ By another person (name): ______
- ☑ Other: familiarity with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☑

May we obtain duplicates at our expense? yes ☑ no ☐

DFG/BDB/1747 Rev. 6/16/09

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

For Office Use Only

Source Code ____ Quad Code ____
Elm Code ____ Occ. No. ____
EO Index No. ____ Map Index No. ____

Date of Field Work (mm/dd/yyyy): 08/17/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Thamnophis hammondii*

Common Name: two-striped garter snake

Species Found? ☑ Yes ☐ No ____ If not, why?

Total No. Individuals 1 Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? ____ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: ____ Number ____ Museum / Herbarium

Reporter: Sam Stewart

Address: 225 S. Lake Ave., Suite 1000
Pasadena, CA. 91101

E-mail Address: sstewart@bonterraconsulting.com

Phone: (626) 351-2000

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

# adults	# juveniles	# larvae	# egg masses	# unknown
	1			

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Los Angeles Landowner / Mgr.: US Forest Service

Quad Name: Condor Peak Elevation: 3,100 ft.

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐
T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐

Source of Coordinates (GPS, topo. map & type): GPS
GPS Make & Model Garmin Etrex Vista H
Horizontal Accuracy 10 feet meters/feet

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 11S 391613, 3797077

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Adult two-striped garter snake observed foraging on east bank of Fox Creek on sandy terrace. Willow and alder riparian woodland with mule fat on banks.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: No development in vicinity. Angeles National Forest.

Visible disturbances: None.

Threats:

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): Powell et al. 1998
- ☐ Compared with specimen housed at: ____
- ☐ Compared with photo / drawing in: ____
- ☐ By another person (name): ____
- ☑ Other: familiarity with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☑

May we obtain duplicates at our expense? yes ☑ no ☐

APPENDIX B-5

SPECIAL STATUS FISH SPECIES SURVEY LETTER REPORT

BonTerra CONSULTING

PASADENA COSTA MESA

T: (714) 444-9199 F: (714) 444-9599
www.BonTerraConsulting.com
151 Kalmus Drive, Suite E-200
Costa Mesa, CA 92626

October 5, 2011

Ms. Erin M. McCarthy
Recovery Permit Coordinator
U.S. Fish and Wildlife Service
6010 Hidden Valley Road, Suite 101

VIA EMAIL
erin_mccarthy@fws.gov

Subject: Results of Focused Presence/Absence Special Status Fish Species Surveys at the Big Tujunga Dam and Reservoir Sediment Removal Project, Los Angeles County, California

Dear Ms. McCarthy:

This Letter Report presents the results of presence/absence surveys for special status fish species, including Santa Ana sucker (*Catostomus santaanae*), Santa Ana speckled dace (*Rhinichthys osculus* ssp. 3), and arroyo chub (*Gila orcutti*) for the Big Tujunga Dam and Reservoir Sediment Removal Project.

Survey Area

Big Tujunga Canyon is located on the southern edge of the San Gabriel Mountains, within the Angeles National Forest, and is located on the U.S. Geological Survey (USGS) Condor Peak 7.5-minute topographic quadrangle (Exhibit 1). The survey area for the special status fish surveys included Big Tujunga Creek extending approximately two river miles upstream of Big Tujunga Reservoir, the Reservoir, and a small section of the creek below the dam including the plunge pool. Topography in the survey area consists of sheer cliffs and steep slopes to the canyon bottom, with elevations ranging from approximately 2,150 to 3,400 feet above mean sea level (msl). The survey area and surrounding vicinity consist of open space within the Angeles National Forest

Big Tujunga Creek consists of two forks, both beginning in the San Gabriel Mountains above the Big Tujunga Dam. The upper portion of Big Tujunga Creek flows from east to west, and several tributaries from the north and south join it as it flows toward Big Tujunga Reservoir. Below the reservoir, the creek is called Big Tujunga Wash. The special status fish survey area is made up of three distinct sections: (1) Big Tujunga Creek upstream of Big Tujunga Reservoir to approximately Fall Creek Campground (approximately two river miles); (2) the edges around Big Tujunga Reservoir; and (3) an area downstream of Big Tujunga Dam, including the plunge pool and adjacent portion of Big Tujunga Wash downstream to the first maintenance road crossing (Exhibit 1).

Big Tujunga Canyon is characterized by very steep slopes, shallow soils, and watercourses contained within bedrock channels. Erosion has deposited alluvium (including boulders, cobbles, gravel, and coarse to fine sandy soils) within the stream course. Topography is irregular and stream grade, width, and flow velocity vary but are generally moderate. The creek channel morphology within the survey area includes portions with narrow, incised, fast-moving water; portions with wider, slow-moving water; deep pools; and a relatively broad alluvial wash with multiple meanders. In the survey area, Big Tujunga Creek is perennial. Representative photographs of the survey area are provided in Appendix A.

The water elevation in Big Tujunga Reservoir at the time of the surveys was approximately 2,228.5 to 2,229.0 feet above msl. At the time of the surveys, the depth of the reservoir at the dam face was approximately 60 feet (Chimienti 2011). The body of the reservoir itself consists of open water with some floating mats of vegetation (emergent vegetation rooted in the woody debris floating on the surface). These floating mats move around the reservoir with the wind, and often accumulate along the edges of the reservoir. The emergent vegetation is composed primarily of cattails (*Typha* sp.) and arroyo willow (*Salix lasiolepis*).

Upstream of the reservoir, vegetation along Big Tujunga Creek consists primarily of southern riparian scrub species. Big Tujunga Canyon burned during the 2009 Station Fire; thus, the riparian canopy is sparse through much of the creek. The average vegetation heights are approximately five to seven feet. Dominant species in this portion of the survey area include arroyo willow, red willow (*Salix laevigata*), white alder (*Alnus rhombifolia*) and Fremont cottonwood (*Populus fremontii* ssp. *fremontii*), with mule fat (*Baccharis salicifolia*), rough sedge (*Carex senta*), wild oat (*Avena* sp.), and white sweet clover (*Melilotus alba*) in the understory.

Below the dam, the plunge pool is mostly unvegetated. Downstream of the plunge pool, Big Tujunga Wash consists mainly of willow riparian forest dominated by arroyo willow, red willow, white alder, and Fremont cottonwood. Other common species present include mule fat, hoary nettle (*Urtica dioica* ssp. *holosericea*), and mugwort (*Artemisia douglasiana*).

Species Descriptions

Santa Ana Sucker (*Catostomus santaanae*)

Santa Ana sucker is a federally listed Threatened species, and a California Species of Special Concern. Santa Ana sucker is endemic to the Los Angeles basin. Its historic range consisted of the Los Angeles, San Gabriel, and Santa Ana River systems; only these populations within its historic range are federally protected. The most recent California Natural Diversity Database (CNDDB) record of Santa Ana sucker in the vicinity of the survey area reported a location approximately 7.5 miles downstream of the dam in Big Tujunga Wash in 2007 (CDFG 2011). Santa Ana sucker was observed in the survey area along Big Tujunga Wash between the Big Tujunga Dam and Delta Flats in 2009 (SMEA 2010).

On January 4, 2005, the U.S. Fish and Wildlife Service (USFWS) published a final rule designating 8,305 acres of critical habitat for the Santa Ana sucker (USFWS 2005). Two areas were designated in Los Angeles County, one along the San Gabriel River (Unit 2) and the other along Big Tujunga Creek (Unit 3). This designation did not include habitat for the species in Orange, Riverside, or San Bernardino Counties. Following lawsuits, the USFWS proposed a revised critical habitat on December 9, 2009, adding habitat along the Santa Ana River in Orange, Riverside, and San Bernardino Counties to critical habitat for the species (USFWS 2009). This increased the critical habitat designation to 9,331 acres. On December 14, 2010, the USFWS published the final rule formalizing the revised critical habitat (USFWS 2010). A portion of the survey area, the area downstream of Big Tujunga Reservoir, is within the 2010 revised critical habitat for Santa Ana sucker (Exhibit 2).

Santa Ana sucker is found in small, shallow streams with flows that run from slow to swift. They are most abundant where water is clear and unpolluted, although they can withstand seasonal turbidity. Santa Ana sucker is often associated with bottom materials of boulders, gravel, and cobble where there are growths of filamentous algae; they are also occasionally found on sand or mud substrates. Although Santa Ana sucker have generalized stream habitat requirements, they are intolerant of polluted or highly modified streams (Moyle et al. 1995). The majority of their diet consists of algae and detritus that they scrape from rock surfaces, as well as occasional aquatic insect larvae.

Adult Santa Ana sucker rarely exceed a standard length of eight inches (measured from snout tip to anterior of the caudal fin [tail fin]). They exhibit a broad mouth with notches at the junction of the upper and lower lips, and the median notch on the lower lip is less well defined. Their body coloration is silver on the ventral (belly/underside) surface and darker with irregular blotches on the dorsal (back/top) surface. Their scale pattern has longitudinal lateral striping along the length of their body. The interradial membrane (membrane between the spines) of the caudal fin is pigmented, and the anal and pelvic fins normally lack pigment (Moyle et al. 1995).

Santa Ana suckers are relatively short-lived; they become reproductively mature by the first year and spawn during the first and second years. Most suckers do not survive past the second year, although a few live three to four years. There is no sexual dimorphism (distinguishable appearances between males and females), although reproductive males develop breeding tubercles (small bumps) over most of the body (Moyle et al. 1995).

Santa Ana sucker spawning occurs from April until early July, but peaks in late May and early June. Santa Ana suckers spawn over gravel beds in flowing water where the female deposits the eggs in fine gravel substrate. The eggs hatch within 36 hours at 55.5 degrees Fahrenheit (°F), and the fry (fish hatchlings) congregate in shallow, slow-moving waters along the stream margins in water depths ranging from 1 to 5.5 inches, often over very soft sand or mud substrates. Edgewater habitat is probably used by fry because (1) it typically contains fewer predatory fish and (2) shallow water is warmer and probably allows the suckers to grow more quickly (USFWS 2010).

The Santa Ana sucker is currently threatened by water diversions, alteration of stream channels, changes in the watershed that result in erosion and debris flows, pollution and predation by non-native fishes. The primary cause for the extirpation of the Santa Ana sucker from lowland reaches of the Los Angeles, San Gabriel, and Santa Ana Rivers is most likely due to increased urbanization (USFWS 2000).

Arroyo Chub (*Gila orcutti*)

Arroyo chub is a California Species of Special Concern. It is a small freshwater fish native to the watersheds of the Los Angeles, San Gabriel, San Luis Rey, Santa Ana, and Santa Margarita Rivers and those of the Malibu and San Juan Creeks. Arroyo chub have also been successfully introduced into the Santa Ynez, Santa Maria, Cuyama, and Mojave River systems and other smaller coastal streams (Moyle 2002). The arroyo chub is now common at only three of its native locations: Santa Margarita and De Luz Creeks in San Diego County; Trabuco and San Juan Creeks in Orange County; and Malibu Creek in Los Angeles County (Swift et al. 1993). The most recent CNDDB record of arroyo chub in the vicinity of the survey area reported a location approximately 10 miles southwest of Big Tujunga Reservoir along Big Tujunga Wash and Haines Canyon Creek, approximately 0.62–1.1 miles downstream of the Interstate (I) 210 freeway (CDFG 2011). Arroyo chub was observed in the survey area along Big Tujunga Wash between the Big Tujunga Dam and Delta Flats in 2009 (SMEA 2010).

Arroyo chub are small fish that can reach standard lengths of 4.72 inches, although typical adult lengths are 2.76–3.94 inches (Moyle 2002). Males are distinguished from females by their larger fins and, when breeding, by the prominent patch of tubercles on the upper surface of the pectoral fins (forelimbs). Arroyo chub have chunky bodies, fairly large eyes, and small mouths. Their body color is silver or grey to olive-green dorsally, white ventrally, and they usually have a dull grey lateral band (Moyle et al. 1995).

Arroyo chub are found in coastal freshwater streams and rivers with sustained flows and emergent vegetation. They prefer the slowest moving sections where the substrates consist primarily of sand or mud, but they can also be found in fairly fast-moving (31.5 inches/second or more) sections of stream over coarse substrates (Moyle 2002). Arroyo chub also prefer water with depths greater than 15.75 inches (Moyle 2002). This species is adapted to survive in widely fluctuating water temperatures (50°F to 75°F) and fluctuating dissolved oxygen levels common in coastal streams. Arroyo chub form schools and feed heavily on algae and other plants as well as small crustaceans and aquatic insect larvae (Moyle 2002).

Arroyo chub rarely live beyond four years and begin to reproduce at one year of age (McGinnis 2006). Arroyo chub breed more or less continuously from February through August, although most spawning occurs in June and July. The majority of spawning occurs in pools or in quiet edge waters with temperatures of 57.2°F–71.6° F (Moyle 2002). Eggs adhere to the substrate or plants and hatch in approximately four days. After hatching, the fry spend the next 3–4 months in quiet water in the water column and usually occur among vegetation or other flooded cover (Moyle 2002).

Arroyo chub are threatened by the introduction of non-native fish and show a decline in the watershed when non-native species become abundant. The introduction of largemouth bass (*Micropterus salmoides*) and green sunfish (*Lepomis cyanellus*) pose a threat to arroyo chub and could be responsible for their extirpation from many areas (Moyle et al. 1995). Arroyo chub are also threatened by water diversions, urbanization of watersheds, and pollution.

Santa Ana Speckled Dace (*Rhinichthys osculus* ssp. 3)

Santa Ana speckled dace is a California Species of Special Concern. The Santa Ana speckled dace has not been formally described as a subspecies, which is why it is not federally listed. Many believe that Santa Ana speckled dace deserves subspecies status because they have morphological differences that distinguish them from other California dace: they have finer scales, a better developed frenum (a flap of skin attaching the snout to upper lip), a longer head, and smaller eggs (Moyle et al. 1995).

Santa Ana speckled dace was historically distributed throughout the upland portions of the Santa Ana, San Gabriel, and Los Angeles River systems, but it currently has a limited distribution in the headwaters of the Santa Ana and San Gabriel Rivers (Moyle et al. 1995). The most recent CNDDB record of Santa Ana speckled dace in the vicinity of the survey area was reported from a location approximately 10 miles southwest of Big Tujunga Reservoir along Big Tujunga Wash and Haines Canyon Creek, 0.62–1.1 miles downstream of the I-210 freeway (CDFG 2011).

Santa Ana speckled dace is a small, freshwater fish that rarely exceeds three inches in length. Physical characteristics of the Santa Ana speckled dace include one barbel (whisker-like) at the end of each jaw and a frenum on the upper lip. The back and sides of the fish are dusky yellow or olive, and are covered with dark speckles and splotches. During breeding, the base of the fins in both sexes and the snouts and lips of males often turn red. Also, males usually develop tubercles on their pectoral fins and head (Moyle 2002).

Santa Ana speckled dace require perennial streams with summer water temperatures of 62°F–68°F (Moyle et al. 1995). They prefer riffle habitats in clean, rocky-bottomed streams and rivers, but are also found near the shores of lakes (Moyle et al. 1995). This species exhibits predatory avoidance behaviors such as nocturnal feeding and hiding among the bottom rocks during daylight hours. Except for the breeding season, this species does not form large groups, but instead forages in small groups that can easily blend into the bottom rocks to avoid predation. They forage on a large variety of small, ground-dwelling invertebrates, zooplankton, filamentous algae, and other plant material (McGinnis 2006).

Santa Ana speckled dace typically have a life span of three years, but can live up to six years or more. They become sexually mature in their second year, and spawning occurs throughout the summer months. Speckled dace lay and fertilize their eggs on the stream bottom in rocks and gravel. The eggs hatch in six days, and similar to most other minnows, the young seek out calm inshore areas where zooplankton is available to feed upon (Moyle 2002; McGinnis 2006).

Santa Ana speckled dace are threatened by the introduction of non-native fish and show a decline in the watershed when non-native species become abundant. The introduction of largemouth bass and green sunfish pose a threat to Santa Ana speckled dace and could be responsible for their extirpation from many areas (Moyle et al. 1995). Santa Ana speckled dace are also threatened by water diversions, urbanization of watersheds, and pollution.

Survey Methodology

Surveys were conducted by ECORP Consulting Biologists Todd Chapman (TE-110094-2) and Brian Zitt (TE-27460A-0) with BonTerra Consulting Biologists Jennifer Pareti and Dr. Carl Demetropoulos. Prior to the surveys, Todd Chapman consulted John O’Brien from the California Department of Fish and Game (CDFG) for approval to conduct the surveys for special status fish species in the survey area. Survey methods included electrofishing and seining depending on the location within the survey area (Exhibit 3).

Electrofishing was conducted using a backpack electrofisher (Smith Root Model LR-20B). Adhering to the sampling guidelines provided by USFWS, pulse frequency was 30 hertz (hz); the pulse width did not exceed 5 milliseconds; the duty cycle was 15 percent; and the voltage output was 200 volts (V). Electrofishing was conducted in Big Tujunga Creek upstream of the reservoir on August 15, 2011, and also in Big Tujunga Wash immediately downstream of the dam on August 17, 2011. While electrofishing, care was taken to avoid algal mats and dense vegetation in the creek to avoid impacts on refugia for young fish. Captured fishes were immediately transferred into a container of clean aerated water taken from the wash and were visually identified. Native fishes were released unharmed at the point of capture. Non-native fishes were not returned to Big Tujunga Creek/Wash. Electrofishing was immediately stopped once the presence of the three native special status fish species was confirmed within the survey area.

Four large seine hauls were conducted along the edges of the reservoir, and one seine haul was conducted in the plunge pool immediately below the dam. Seining was conducted using a 100-foot by 10-foot deep nylon knotless delta weave bagged seine with ¼-inch mesh. Seining along the edges of the reservoir was accomplished using a small motorized boat to deploy the seine net, which was then hauled onto the shore. Captured fishes were immediately transferred into a container of clean aerated water taken from the reservoir and were visually identified.

Captured non-native fishes and invertebrates were not returned to Big Tujunga Reservoir or Big Tujunga Wash.

All fish observed during the survey were recorded in field notes. A list of all wildlife species observed during the surveys is included in Appendix B.

Survey Results

Survey date, time, and weather data for the special status fish surveys are shown in Table 1. During the August 15, 2011 survey, which covered the two miles of Big Tujunga Creek upstream of the reservoir, no fish were found. During the August 17, 2011 survey, which covered the reservoir and the area downstream of the reservoir, all three native special status fishes were observed or captured just downstream of the dam in Big Tujunga Wash (Table 2). One large adult Santa Ana sucker was captured and 20 others were visually observed in Big Tujunga Wash. A total of 96 arroyo chub were captured and over 150 others were visually observed during the seining and electrofishing efforts below the dam in Big Tujunga Wash. One Santa Ana speckled dace was also captured during electrofishing downstream of the dam. No special status fish species were found in the reservoir.

Two special status reptile species were observed during the surveys. Two two-striped garter snakes (*Thamnophis hammondii*) and one coastal western whiptail (*Aspidoscelis tigris stejnegeri*) were observed on August 15, 2011. CNDDB forms for these observations will be submitted to CDFG and are included in Appendix C.

Non-native aquatic species observed during these surveys included red-swamp crayfish (*Procambarus clarkii*), green sunfish (*Lepomis cyanellus*), black bullhead (*Ameiurus melas*), and American bullfrog (*Lithobates catesbeianus*). The crayfish, green sunfish, and black bullhead captured during the surveys were removed from the reservoir and Big Tujunga Wash because non-native species are known predators of the special status native fish species.

TABLE 1
FISH SURVEY CONDITIONS DATA

Survey Date	Surveyor Name(s)	Time	Atmospheric Conditions				Water Conditions				
			Percent Cloud Cover (%)	Air Temperature (°F)	Wind Speed (mph)	Weather Conditions	Water Temperature (°F)	Salinity	Oxidation Reduction Potential (ORP)	Nephelo metric Turbidity Unit (NTU)	Total Dissolved Solids (TDS)
August 15, 2011	T. Chapman B. Zitt J. Pareti	8:15 AM–4:00 PM	15	73	0–5	sunny	68.3	0.2 ppt	76 mV	500	0.277
August 17, 2011	T. Chapman B. Zitt J. Pareti C. Demetropoulos	8:15 AM–2:00 PM	25	77	0–3	partly cloudy	67.9	0.2 ppt	170 mV	0	0.259

°F: degrees Fahrenheit; mph: miles per hour; ppt: parts per thousand; mV: millivolts; ORP: measure of the cleanliness of the water and its ability to break down contaminants; NTU: measurement of the lack of clarity of water; TDS: total dissolved solids.

TABLE 2
SURVEY RESULTS

Survey Date	Location	Method	Species Captured (Number of Individuals)					Species Visually Observed (Number of Individuals)			
			Arroyo chub	Santa Ana speckled dace	Santa Ana sucker	Black bullhead	Red swamp crayfish	Santa Ana sucker	Arroyo chub	Red swamp crayfish	Green sunfish
August 15, 2011	Upstream of reservoir	Electrofishing	0	0	0	0	0	0	0	0	0
August 17, 2011	Reservoir	Seine 1	0	0	0	30	0	0	0	0	0
August 17, 2011	Reservoir	Seine 2	0	0	0	0	0	0	0	0	0
August 17, 2011	Reservoir	Seine 3	0	0	0	1	0	0	0	0	0
August 17, 2011	Reservoir	Seine 4	0	0	0	0	0	0	0	0	0
August 17, 2011	Plunge Pool beneath dam	Seine 5	46	0	0	1	0	0	50	0	0
August 17, 2011	Downstream of reservoir	Electrofishing	50	1	1	0	1	20	100+	30	1
		Total	**96**	**1**	**1**	**32**	**1**	**20**	**150+**	**30**	**1**

BonTerra Consulting has appreciated the opportunity to assist with this project. Please contact David Hughes at (626) 351-2000 or Jennifer Pareti at (714) 444-9199 if you have questions or comments.

Sincerely,

BONTERRA CONSULTING

Amber S Oneal for

David T. Hughes
Senior Project Manager

Jennifer S. Pareti
Biologist

"I certify that the information in this survey report and enclosed exhibits fully and accurately represents my work."

Todd Chapman
Senior Ichthyologist, ECORP Consulting, Inc.
(TE-110094-2)

Brian Zitt
Senior Ichthyologist, ECORP Consulting, Inc.
(TE-27460A-0)

Enclosures: Exhibits 1, 2, and 3
Appendix A – Site Photographs
Appendix B – Wildlife Compendium
Appendix C – CNDDB Forms

cc: Kavita Mahulikar
Ryan Butler

REFERENCES

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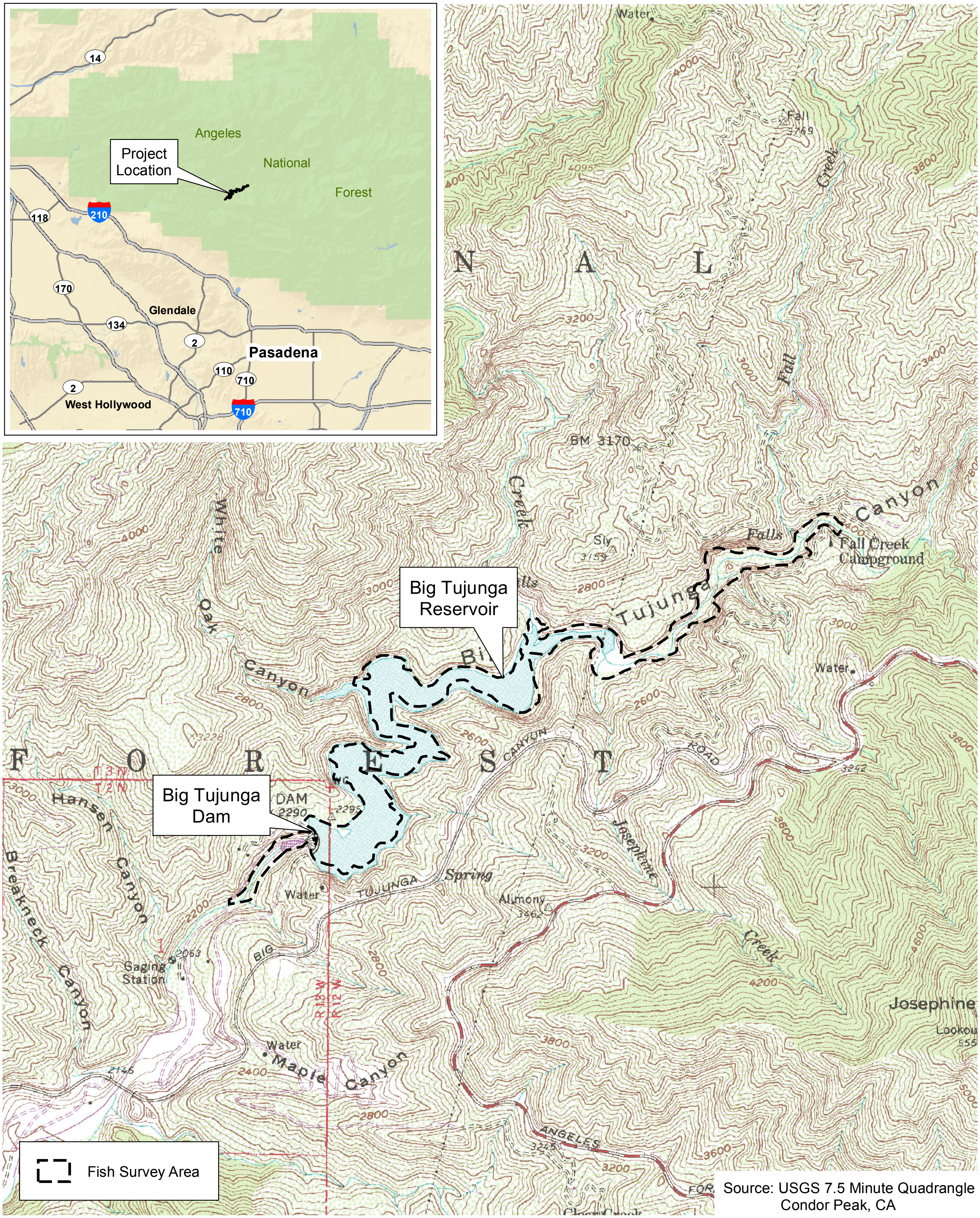
———. 2000 (April 12). Endangered and Threatened Wildlife and Plants; Threatened Status for the Santa Ana Sucker (*Catostomus santaanae*); Final Rule. *Federal Register* 65(71): 19686–19698. Washington, D.C.: USFWS.



D:\Projects\CoLADPW\J162\MXD\ex_lv_usgs_fish_V002.mxd

Project Location

Exhibit 1

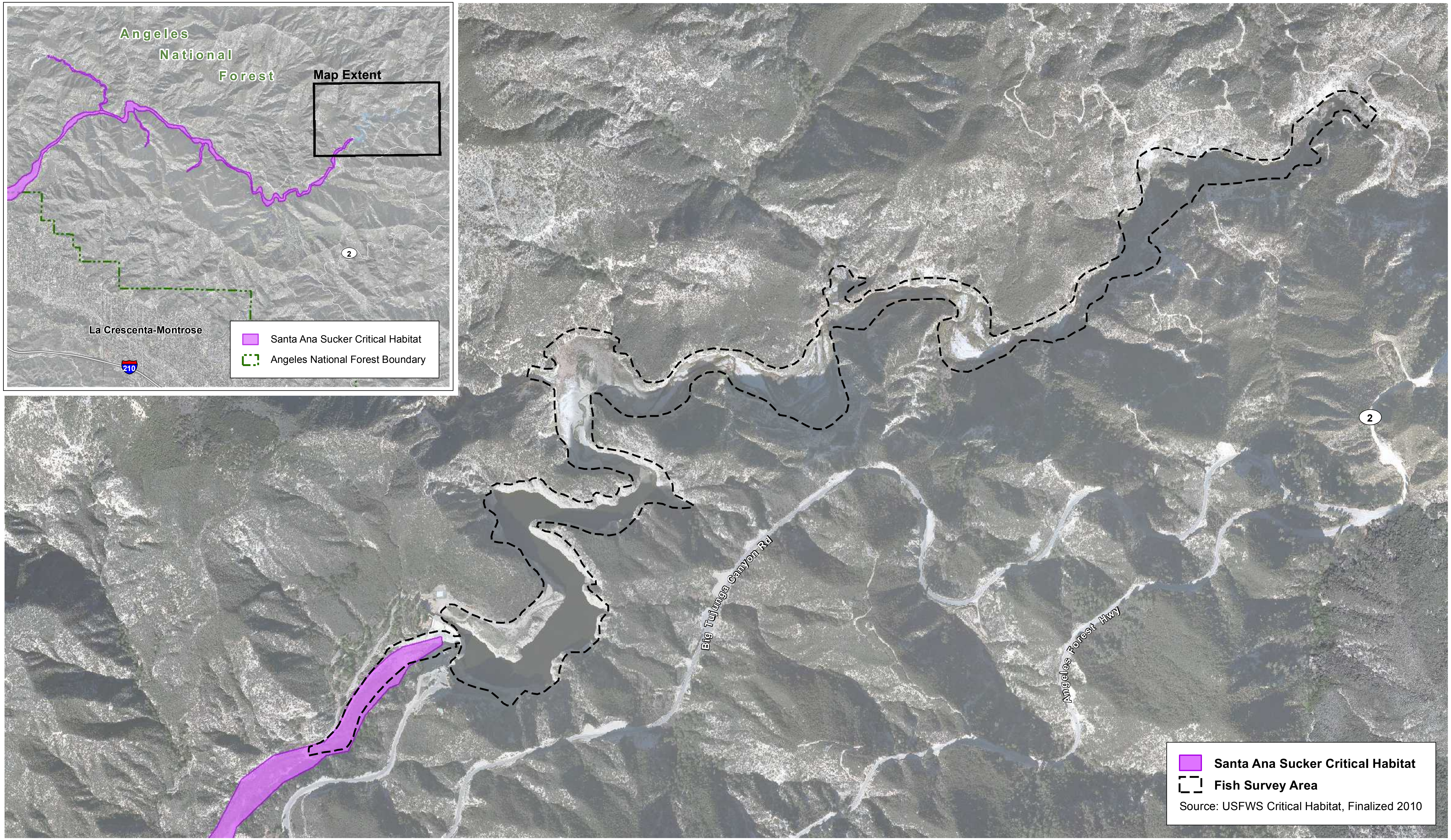
Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

(Rev: 9-08-2011 JCD) PAS\Projects\CoLADPW\J162\Graphics\Bio\Fish\Ex1_LV_usgs.pdf



Critical Habitat

Exhibit 2

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

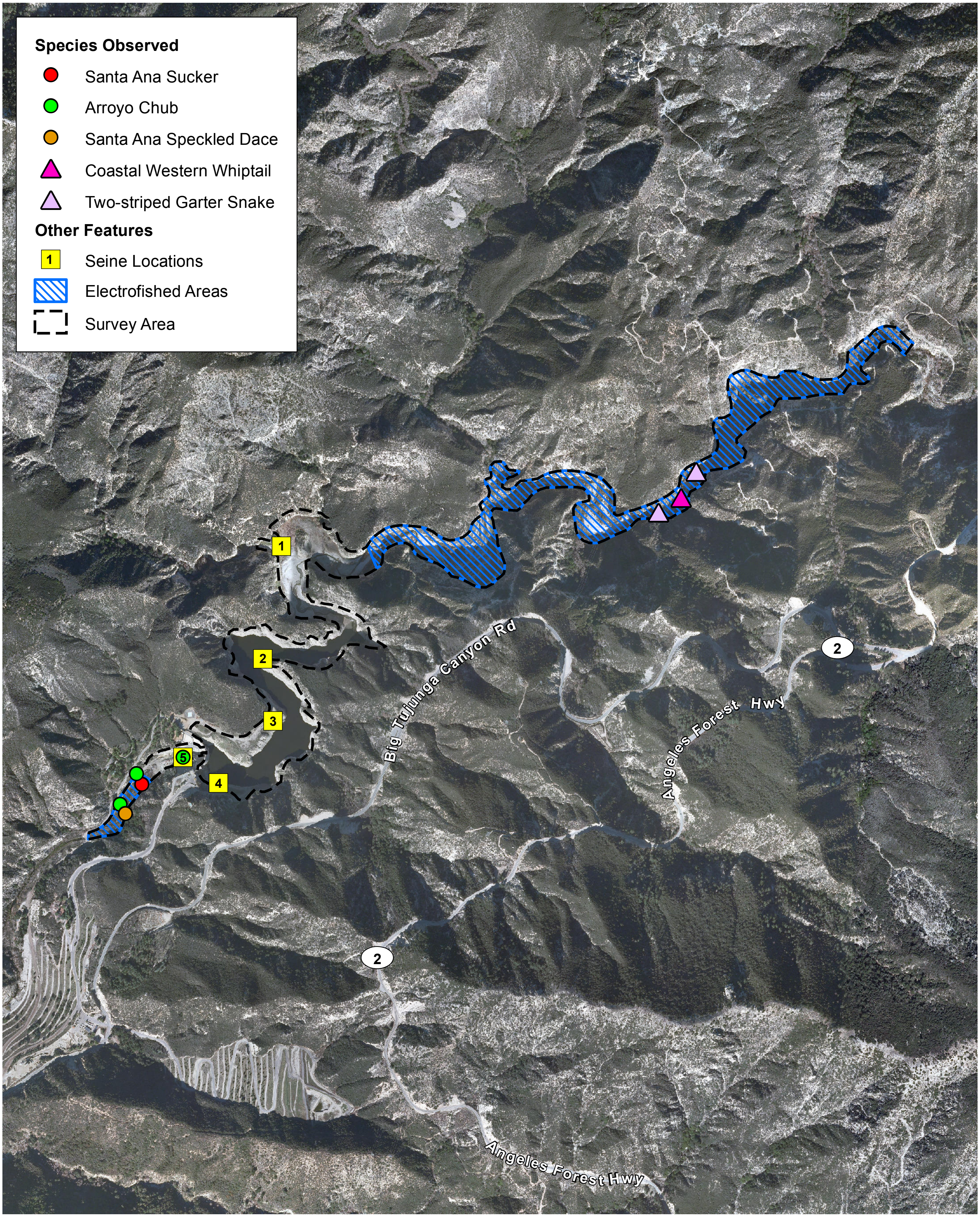
N W E S

800 400 0 800
Feet

BonTerra CONSULTING

(Rev: 9-19-2011 JCD) Projects\CoLADPW\J162\Graphics\Bio\Fish\Ex2_Critical_Habitat.pdf

D:\Projects\CoLADPW\J162\MXD\Ex_critical_habitat_V002.mxd



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Survey Results

Exhibit 3

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

N S W E

1,500 750 0 1,500 Feet

BonTerra CONSULTING

(Rev: 9-21-2011 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Fish\Ex3_SurveyResults.pdf

APPENDIX A

SITE PHOTOGRAPHS

Facing north. Big Tujunga Reservoir.

Facing south. Floating vegetation within Big Tujunga Reservoir.

Facing upstream. Northeast portion of Big Tujunga Reservoir.

Facing upstream. Directly upstream of Big Tujunga Reservoir.

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Site Photographs

Appendix A-2

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

BonTerra CONSULTING

(Rev: 09-07-11 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Fish\AppA_2.pdf

Facing upstream. Big Tujunga Creek.

Facing upstream. Big Tujunga Creek.

D:\Projects\CoLADPW\J162\Graphics\AppA_3.ai

Site Photographs

Appendix A-3

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

BonTerra CONSULTING

(Rev: 09-21-11 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Fish\AppA_3.pdf

Facing upstream. Northern portion of the survey area in Big Tujunga Creek.

Releasing seine at location #1 in northern portion of Big Tujunga Reservoir.

Arroyo chub (top) and Santa Ana sucker (bottom) caught downstream of Big Tujunga Dam.

Santa Ana speckled dace caught downstream of Big Tujunga Dam.

D:\Projects\CoLADPW\J162\Graphics\AppA_5.ai

Site Photographs

Appendix A-5

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

BonTerra CONSULTING

(Rev: 09-07-11 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Fish\AppA_5.pdf

APPENDIX B

WILDLIFE COMPENDIUM

APPENDIX B
WILDLIFE COMPENDIUM

BIG TUJUNGA WILDLIFE COMPENDIUM
SPECIES
Fish
CYPRINIDAE – MINNOWS
Gila orcutti arroyo chub
Rhinichthys osculus ssp. 3 Santa Ana speckled dace
CATOSTOMIDAE – SUCKERS
Catostomus santaanae Santa Ana sucker
ICTALURIDAE – CATFISH
*Ameiurus melas** black bullhead
CENTRARCHIDAE – SUNFISH
*Lepomis cyanellus** green sunfish
Amphibians
HYLIDAE – TREEFROGS
Pseudacris [Hyla] cadaverina California treefrog
RANIDAE – TRUE FROGS
*Lithobates [Rana] catesbeianus [catesbeiana]** American bullfrog
Reptiles
PHRYNOSOMATIDAE – ZEBRA-TAILED, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, AND HORNED LIZARDS
Sceloporus occidentalis western fence lizard
TEIIDAE – WHIPTAIL LIZARDS
Aspidoscelis [Cnemidophorus] tigris stejnegeri coastal western whiptail
COLUBRIDAE – COLUBRID SNAKES
Thamnophis hammondii two-striped garter snake
Birds
PHALACROCORACIDAE – CORMORANTS
Phalacrocorax auritus double-crested cormorant
ARDEIDAE – HERONS
Ardea Herodias great blue heron
ACCIPITRIDAE – HAWKS
Buteo jamaicensis red-tailed hawk

APPENDIX B
WILDLIFE COMPENDIUM

BIG TUJUNGA WILDLIFE COMPENDIUM
SPECIES
TROGLODYTIDAE – WRENS
Catherpes mexicanus canyon wren
Invertebrates
CAMBARIDAE – CAMBARID CRAYFISH
*Procambarus clarkia** red swamp crayfish
* introduced species

APPENDIX C

CNDDB FORMS

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/17/2011

For Office Use Only

Source Code ____ Quad Code ____
Elm Code ____ Occ. No. ____
EO Index No. ____ Map Index No. ____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Gila orcutti*

Common Name: Arroyo chub

Species Found? ☑ Yes ☐ No ____ If not, why?

Total No. Individuals 200 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? ____ Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: ____ Number ____ Museum / Herbarium

Reporter: Todd Chapman, Ecorp
Address: 1801 Park Court Place, Bldg B, Suite 103
Santa Ana, CA 92701
E-mail Address: tchapman@ecorpconsulting.com
Phone: (714) 648-0630

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

50	150			
# adults	# juveniles	# larvae	# egg masses	# unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Los Angeles Landowner / Mgr.: Los Angeles County Department of Public Works

Quad Name: Condor Peak Elevation: 2091 ft

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy +/- 10 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 3795304
390613

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Along the creek, vegetation consists mainly of willow riparian forest dominated by arroyo willow, red willow, white alder and Fremont cottonwood. Other common species present included mule fat, hoary nettle (Urtica dioica ssp. holosericea), and mugwort (Artemisia douglasiana).

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: open space

Visible disturbances: recently burnt (2009 Station Fire)

Threats: non-native aquatic species present

Comments:

Determination: *(check one or more, and fill in blanks)*

☐ Keyed (cite reference): ____
☐ Compared with specimen housed at: ____
☐ Compared with photo / drawing in: ____
☐ By another person (name): ____
☑ Other: experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/17/2011

For Office Use Only

Source Code ______ Quad Code ______
Elm Code ______ Occ. No. ______
EO Index No. ______ Map Index No. ______

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Rhinichthys osculus*

Common Name: Santa Ana speckled dace

Species Found? ☑ Yes ☐ No ______ If not, why?

Total No. Individuals 1 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? ______ Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: Todd Chapman, Ecorp

Address: 1801 Park Court Place, Bldg B, Suite 103
Santa Ana, CA 92701

E-mail Address: tchapman@ecorpconsulting.com

Phone: (714) 648-0630

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

1				
# adults	# juveniles	# larvae	# egg masses	# unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description* *(please attach map AND/OR fill out your choice of coordinates, below)

County: Los Angeles Landowner / Mgr.: Los Angeles County Department of Public Works

Quad Name: Condor Peak Elevation: 2091 ft

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy +/- 10 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 3795077
390363

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Along the creek, vegetation consists mainly of willow riparian forest dominated by arroyo willow, red willow, white alder and Fremont cottonwood. Other common species present included mule fat, hoary nettle (Urtica dioica ssp. holosericea), and mugwort (Artemisia douglasiana).

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: open space

Visible disturbances: recently burned (2009 Station Fire)

Threats: non-native aquatic species present

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☐ Keyed (cite reference): ______
- ☐ Compared with specimen housed at: ______
- ☐ Compared with photo / drawing in: ______
- ☐ By another person (name): ______
- ☑ Other: experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 *email: CNDDB@dfg.ca.gov*

Date of Field Work (mm/dd/yyyy): 08/17/2011

For Office Use Only

Source Code		Quad Code	
Elm Code		Occ. No.	
EO Index No.		Map Index No.	

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Catostomus santaanae*

Common Name: Santa Ana sucker

Species Found? ☑ Yes ☐ No ____ If not, why?

Total No. Individuals 21 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? ____ Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: ____ Number ____ Museum / Herbarium

Reporter: Todd Chapman, Ecorp

Address: 1801 Park Court Place, Bldg B, Suite 103
Santa Ana, CA 92701

E-mail Address: tchapman@ecorpconsulting.com

Phone: (714) 648-0630

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

21 # adults ____ # juveniles ____ # larvae ____ # egg masses ____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Los Angeles Landowner / Mgr.: Los Angeles County Department of Public Works

Quad Name: Condor Peak Elevation: 2091 ft

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy +/- 10 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 3795077
390363

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Along the creek, vegetation consists mainly of willow riparian forest dominated by arroyo willow, red willow, white alder and Fremont cottonwood. Other common species present included mule fat, hoary nettle (Urtica dioica ssp. holosericea), and mugwort (Artemisia douglasiana).

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: open space

Visible disturbances: recently burned (2009 Station Fire)

Threats: non-native aquatic species present

Comments:

Determination: *(check one or more, and fill in blanks)*
- ☐ Keyed (cite reference):
- ☐ Compared with specimen housed at:
- ☐ Compared with photo / drawing in:
- ☐ By another person (name):
- ☑ Other: experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/15/2011

For Office Use Only

Source Code ____ Quad Code ____
Elm Code ____ Occ. No. ____
EO Index No. ____ Map Index No. ____

Reset | Send Form

California Native Species Field Survey Form

Scientific Name: Thamnophis hammondii

Common Name: two-striped garter snake

Species Found? ☑ Yes ☐ No ____ If not, why?

Total No. Individuals 2 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? ____ Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: ____ Number ____ Museum / Herbarium

Reporter: Todd Chapman, Ecorp

Address: 1801 Park Court Place, Bldg B, Suite 103
Santa Ana, CA 92701

E-mail Address: tchapman@ecorpconsulting.com

Phone: (714) 648-0630

Plant Information

Phenology: ___% vegetative ___% flowering ___% fruiting

Animal Information

# adults	# juveniles	# larvae	# egg masses	# unknown
2				

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

***Location Description* (please attach map AND/OR fill out your choice of coordinates, below)**

County: Los Angeles Landowner / Mgr.: Los Angeles County Department of Public Works

Quad Name: Condor Peak Elevation: 2257 ft

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy +/- 10 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates:
3796179 / 392281
3796318 / 392411

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Big Tujunga Canyon burned in the 2009 Station Fire; the riparian canopy is sparse through much of the creek and average vegetation heights are approximately five to seven feet. Dominant species in this portion of the survey area include arroyo willow (Salix lasiolepis), red willow (Salix laevigata), white alder (Alnus rhombifolia) and Fremont cottonwood (Populus fremontii ssp. fremontii) with mule fat (Baccharis salicifolia), rough sedge (Carex senta), wild oat (Avena sp.), and white sweet clover (Melilotus alba).

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: open space

Visible disturbances: recently burned (2009 Station Fire)

Threats:

Comments: 2 adults found at separate locations in the creek

Determination: *(check one or more, and fill in blanks)*

- ☐ Keyed (cite reference): ____
- ☐ Compared with specimen housed at: ____
- ☑ Compared with photo / drawing in: Stebbins
- ☐ By another person (name): ____
- ☑ Other: experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/15/2011

For Office Use Only

Source Code ____ Quad Code ____
Elm Code ____ Occ. No. ____
EO Index No. ____ Map Index No. ____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Aspidoscelis tigris stejnegeri

Common Name: coastal western whiptail

Species Found? ☑ Yes ☐ No ____ If not, why?

Total No. Individuals 1 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? ____ Yes, Occ. # ☐ no ☐ unk.

Collection? If yes: ____ Number ____ Museum / Herbarium

Reporter: Todd Chapman, Ecorp
Address: 1801 Park Court Place, Bldg B, Suite 103
Santa Ana, CA 92701
E-mail Address: tchapman@ecorpconsulting.com
Phone: (714) 648-0630

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

1 # adults | ____ # juveniles | ____ # larvae | ____ # egg masses | ____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

County: Los Angeles Landowner / Mgr.: Los Angeles County Department of Public Works

Quad Name: Condor Peak Elevation: 2257 ft

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy +/- 10 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 3796179 / 392281

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Big Tujunga Canyon burned in the 2009 Station Fire; the riparian canopy is sparse through much of the creek and average vegetation heights are approximately five to seven feet. Dominant species in this portion of the survey area include arroyo willow (Salix lasiolepis), red willow (Salix laevigata), white alder (Alnus rhombifolia) and Fremont cottonwood (Populus fremontii ssp. fremontii) with mule fat (Baccharis salicifolia), rough sedge (Carex senta), wild oat (Avena sp.), and white sweet clover (Melilotus alba).

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: open space

Visible disturbances: recently burned (2009 Station Fire)

Threats:

Comments:

Determination: *(check one or more, and fill in blanks)*

☐ Keyed (cite reference): ____
☐ Compared with specimen housed at: ____
☑ Compared with photo / drawing in: Stebbins
☐ By another person (name): ____
☑ Other: experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

APPENDIX B-6

WESTERN POND TURTLE SURVEY LETTER REPORT

January 4, 2012

Mr. Philip Siongco
Water Resources Division
Department of Public Works
County of Los Angeles
900 South Fremont Avenue
Alhambra, California 91802-1460

VIA EMAIL AND U.S. MAIL
PSIONGCO@dpw.lacounty.gov

Subject: Results of Focused Presence/Absence Surveys for Western Pond Turtle for the Big Tujunga Reservoir Sediment Removal Project, Los Angeles County, California

Dear Mr. Siongco:

This Letter Report presents the results of focused surveys to determine the presence or absence of the western pond turtle (*Emys marmorata*) in the Big Tujunga Reservoir and Big Tujunga Creek. The focused surveys were conducted in support of project approvals for the Big Tujunga Reservoir Sediment Removal Project. A qualified Biologist with the necessary experience and a California Department of Fish and Game (CDFG) scientific collecting permit conducted the surveys.

Survey Area

The survey area for the Big Tujunga Reservoir Sediment Removal Project includes Big Tujunga Reservoir, immediately upstream of the Big Tujunga Dam, in the Angeles National Forest and Big Tujunga Creek, approximately one mile upstream of the reservoir in Los Angeles County, California (Exhibit 1). The survey area is located on the U.S. Geological Survey's (USGS') Condor Peak 7.5-minute quadrangle at Township 3 North, Range 12 West, within Sections 29, 31, and 32 (Exhibit 1). Elevations within the survey area range from approximately 2,150 to 3,400 feet above mean sea level. The survey area and surrounding vicinity consist of natural open space within the Angeles National Forest.

Big Tujunga Canyon is characterized by very steep slopes, shallow soils, and watercourses contained within bedrock channels. Erosion has deposited alluvium (including boulders, cobbles, gravel, and coarse to fine sandy soils) within the stream course. Topography is irregular and stream grade, width, and flow velocity vary but are generally moderate. The creek channel morphology within the survey area includes portions with narrow, incised, fast-moving water; portions with wider, slow-moving water; deep pools; and relatively broad alluvial wash with multiple meanders. In the survey area, Big Tujunga Creek is perennial.

Upstream of the reservoir, vegetation along Big Tujunga Creek consists mainly of willow riparian scrub dominated by arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*); however, in some areas it is co-dominated by white alder (*Alnus rhombifolia*) and Fremont cottonwood (*Populus fremontii* ssp. *fremontii*). Other common species include mule fat (*Baccharis salicifolia*), stinging nettle (*Urtica dioica ssp. holosericea*), and mugwort (*Artemisia douglasiana*). In upland areas, coast live oaks (*Quercus agrifolia*) and western sycamores (*Platanus racemosa*) are also present. Big Tujunga Canyon burned during the 2009 Station Fire; thus, the riparian canopy is sparse through much of the creek in this area.

In alluvial terraces and slopes above the main stream course, alluvial scrub is present, dominated by scale-broom (*Lepidospartum squamatum*); other common species include thick-leaf yerba santa (*Eriodictyon crassifolium*), California buckwheat (*Eriogonum fasciculatum*), our Lord's candle (*Yucca whipplei*), black sage (*Salvia mellifera*), deerweed (*Acmispon glaber* [*Lotus scoparius*]), and laurel sumac (*Malosma laurina*). Many of the burned trees and shrubs are resprouting from the base. Poodledog bush (*Turricula parryi*), a fire-following species, is widespread throughout the survey area.

Species Background

The western pond turtle is a CDFG Species of Special Concern and a U.S. Forest Service sensitive species in the Angeles National Forest (CDFG 2011a). The western pond turtle is the only remaining native species of freshwater turtle in California. The current range of the western pond turtle in Southern California extends south from the San Francisco Bay area (excluding Inyo, Mono and Imperial Counties), with a broad range of intergradations from the American River south through the San Joaquin Valley (Bury and Germano 2008). Isolated, extant populations are found in the interior draining Mojave River of California at least as far into the Mojave Desert as Afton Canyon and in the Amargosa River in the vicinity of Lake Elizabeth in northern Los Angeles County (Holland 1994). The closest records of the western pond turtle relative to the survey area include two occurrences downstream of the study area in Big Tujunga Wash (approximately two miles and eight miles downstream) (CDFG 2011b, BonTerra Consulting 2010) and one occurrence approximately six miles upstream at the confluence of Upper Big Tujunga Creek and Lynx Gulch (ICF and BonTerra Consulting 2011).

The western pond turtle has a low carapace (upper shell), 3.5 to 8.5 inches in length, and may be brown, olive or blackish in color, usually with black or brown spots or lines that radiate out from the center of the carapace shields (Stebbins 2003). The limbs of this species have prominent scales that contain black lines or flecks, and the head may also contain black spots or markings (Stebbins 2003). Males tend to have a lighter throat without black markings with a shell that is flatter and more of a solid color than females (Stebbins 2003).

The western pond turtle lays a clutch of 3 to 14 eggs from April to August (Stebbins 2003). Nest sites are usually found in upland habitats beyond the floodplain, typically on south-facing slopes of less than a 60-degree angle (Jennings and Hayes 1994). In Southern California, most hatchlings emerge in the early fall, while some may overwinter in the nest (Holland 1994). Adults in Southern California may be active year round; however, during the coldest months (i.e., between October and April), this species will often seek upland refugia and enter a period of brumation (i.e., reptilian inactivity and decreased metabolic rate in response to seasonal temperature changes [similar to hibernation]), particularly in more temperate, high elevation areas of the species' range (Holland and Goodman 1996). Winter refugia are often found in the same upland habitats as nesting sites.

Agricultural development, flood-control projects, water diversion, and urbanization have resulted in elimination of over 90 percent of the wetland habitats within the historic range of the western pond turtle throughout California (USFWS 1992). These anthropogenic threats have also fragmented the remaining suitable habitat and isolated remaining populations, resulting in a lack of genetic variability.

Invasion of exotic pest species into habitats occupied by western pond turtles is another threat to the continued survival of the species. Invasive, non-native plant species such as tamarisk (*Tamarix ramosissima*) and giant reed (*Arundo donax*) have become established throughout Southern California, reducing plant diversity, altering stream morphology, and eliminating suitable basking sites (Lovich et al. 1994). The invasive bullfrog (*Rana catesbeiana*) is native to eastern North America but is widely established in California. Bullfrogs are voracious predators that will eat any live animal they can swallow, and bullfrog predation of hatchling and young western pond turtles has been recorded (Holland 1994). The intensity of bullfrog predation is severe enough to eliminate recruitment in some western pond turtle populations in Southern California (Overtree and Collings 1997). As a result of the threats listed above, the western pond turtle is believed to be in decline throughout 75 to 80 percent of its range (Stebbins 2003).

Survey Methodology

The survey methodology was based on pond turtle survey and census recommendations made by Holland (1991) and survey protocols developed by Reese and Welsh (1988) and Goodman (1999). Surveys incorporated both visual encounter and live trapping. BonTerra Consulting Senior Herpetologist Samuel Stewart (CDFG Scientific Collecting Permit SC-004421) conducted the surveys from August 2–5, 2011 and from August 8–10, 2011. Mr. Stewart is familiar with the western pond turtle and has the appropriate CDFG authorization to trap and handle the species.

Mr. Stewart conducted live trapping, which consisted of placing live-catch turtle traps at six trapping stations throughout the reservoir. All traps were fitted with tags listing the CDFG Scientific Collecting Permit number under which live trapping was being conducted. Trap station locations were recorded with a Garmin Etrex Vista H Geographic Positioning System (GPS) unit. Trap station locations are presented on Exhibit 2.

The first trapping session consisted of 3 trapping periods lasting approximately 24 hours each (traps were set on August 2, 3, and 4 and checked 24 hours later). The second trapping session consisted of 2 trapping periods lasting approximately 24 hours each (traps were set on August 8 and 9 and checked 24 hours later). Traps were planted and were checked and/or relocated using a kayak. Mr. Stewart conducted visual encounter surveys for turtles during setting and checking of traps and while walking along Big Tujunga Creek upstream of the reservoir to the eastern survey area limit.

Live-catch floating net mesh box traps were used for the survey effort. Net mesh box traps consist of a 24-inch by 18-inch by 8-inch framed box with $^{5}/_{16}$-inch mesh and two 1-way funnel entrances. Floats were placed inside the trap to allow submergence of one trap entrance and flotation of approximately four inches of trap enclosure. Six net mesh box traps were firmly secured to booms, emergent trees, or other immovable objects in the reservoir using nylon rope and baited with fresh fish trimmings. Thread herring and mackerel were placed in the traps as bait. Turtles attracted by the scent of the bait would enter the submerged entrance and surface within the enclosure to breathe.

Survey Results

One western pond turtle was detected in Big Tujunga Reservoir during trapping. It was a single juvenile male western pond turtle (carapace length of 5 inches), that was recovered from Trap Station 3 on August 4, 2011. GPS location, photographic evidence, and carapace measurements were recorded prior to immediate release at the point of capture. No other western pond turtles were detected within the reservoir or within Big Tujunga Creek upstream of the reservoir.

One adult red-eared slider (*Trachemys scripta elegans*), an introduced pond turtle species in the family Emydidae, was recovered from Trap Station 4 during the August 4 trapping session. The red-eared slider was removed from the reservoir and taken into captivity. Additionally, 190 black bullhead (*Ameiurus melas*), an introduced species of catfish, were recovered from multiple trap stations during the trapping sessions and were removed from the reservoir.

A summary of trapping results is provided in Table 1. Photographs of the survey area and notable species observed during surveys are provided in Attachment A. A list of all wildlife species observed during surveys is included in Attachment B. A California Native Diversity Database form for the western pond turtle observed will be submitted to the CDFG and is included in Attachment C.

TABLE 1
SUMMARY OF TRAPPING RESULTS

Start				End					
Trap Set Date	**Time**	**Air Temp (°F)**	**Wind Speed mph**	**Trap Check Date**	**Time**	**Air Temp (°F)**	**Wind Speed mph**	**Trap Results**	**Trap Location[1]**
8/2/2011	10:50AM–4:10PM	84	0–2	8/3/2011	11:00AM–5:05 PM	93	2–8	Trap 1 – Empty	390874, 3795292
								Trap 2 – Empty	390876, 3795338
								Trap 3 – Empty	390802, 3795762
								Trap 4 – Empty	391155, 3796077
								Trap 5 – Empty	390993, 3795615
								Trap 6 – Empty	390876, 3795250
8/3/2011	11:00AM–5:05PM	93	2–8	8/4/2011	1:15PM–7:05 PM	90	2–5	Trap 1 – 1 bullhead	390876, 3795250
								Trap 2 – Empty	391073, 3796181
								Trap 3 – 8 bullhead, 1 western pond turtle	391048, 3796189
								Trap 4 – 44 bullhead, 1 red-eared slider	391094, 3796050
								Trap 5 – Empty	391137, 3796029
								Trap 6 – Empty	391137, 3796064
8/4/2011	1:15AM–7:05 PM	90	2–5	8/5/2011	10:46 AM–2:52 PM	88	0–2	Trap 1 – Empty	390876, 3795250
								Trap 2 – Empty	391073, 3796181
								Trap 3 – 36 bullhead	391048, 3796189
								Trap 4 – 1 juvenile bullhead	391094, 3796050
								Trap 5 – None	391137, 3796029
								Trap 6 – None	391137, 3796064
8/8/2011	10:20 AM–2:15 PM	85	2–5	8/9/2011	11:42 PM–4:44 PM	86	3–8	Trap 1 – 3 bullhead	390876, 3795250
								Trap 2 – None	391073, 3796181
								Trap 3 – None	391048, 3796189
								Trap 4 – 18 bullhead	391094, 3796050
								Trap 5 – 19 bullhead	391137, 3796029
								Trap 6 – 21 bullhead	391137, 3796064

TABLE 1 (Continued)
SUMMARY OF TRAPPING RESULTS

Start				End					
Trap Set Date	Time	Air Temp (°F)	Wind Speed mph	Trap Check Date	Time	Air Temp (°F)	Wind Speed mph	Trap Results	Trap Location[1]
8/9/2011	11:42 PM–4:44 PM	86	3–8	8/10/2011	1:20 PM–6:40 PM	81	1–3	Trap 1 – 10 bullhead	390876, 3795250
								Trap 2 – 18 bullhead	391073, 3796181
								Trap 3 – 5 bullhead	391048, 3796189
								Trap 4 – None	391094, 3796050
								Trap 5 – 4 bullhead	391137, 3796029
								Trap 6 – 1 juvenile bullhead	391137, 3796064

°F: degrees Fahrenheit; mph: miles per hour
[1] GPS points presented in Universal Transverse Mercator (UTM) Coordinates, North American Datum 83, Zone 11S

BonTerra Consulting appreciates the opportunity to assist with this project. Please contact David Hughes or Sam Stewart at (626) 351-2000 with any questions or comments.

Sincerely,

BONTERRA CONSULTING

David T. Hughes

David T. Hughes
Senior Project Manager

Mary Blain
for Samuel C. Stewart IV
Senior Herpetologist

Attachments: Exhibit 1 – Survey Area Location
Exhibit 2 – Survey Results
A – Photographic Documentation
B – Wildlife Compendium
C – CNDDB Form

cc: Ryan Butler, Los Angeles County Department of Public Works

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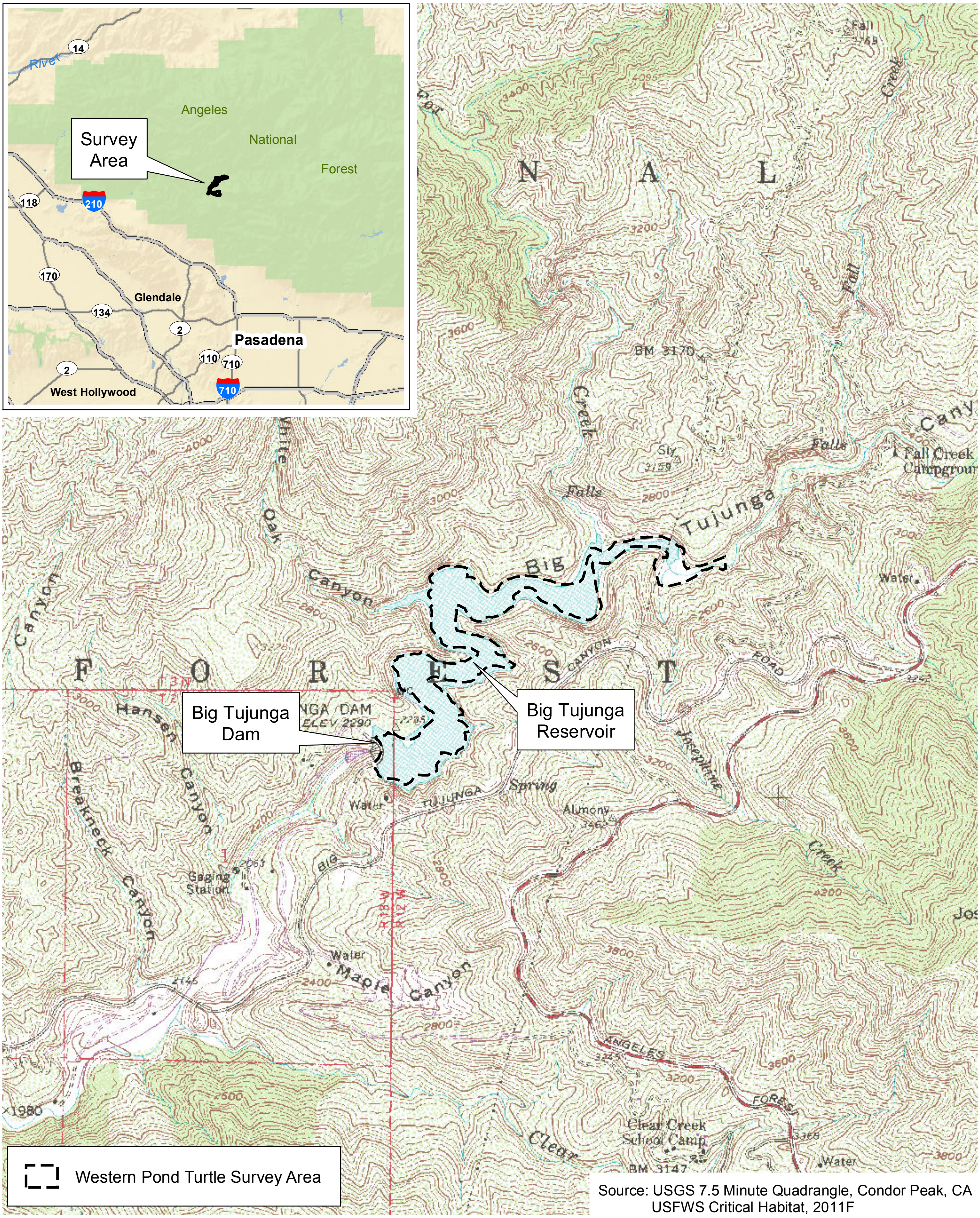

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Survey Area Location

Exhibit 1

Western Pond Turtle Focused Survey for the Big Tujunga Reservoir Sediment Removal Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

(Rev: 1-04-2012 JCD) PAS\Projects\CoLADPW\J162\Graphics\Bio\WPondTurtlet\Ex1_LV_USGS.pdf

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Survey Results

Exhibit 2

Western Pond Turtle Focused Survey for the Big Tujunga Reservoir Sediment Removal Project

N W E S

700 350 0 700 Feet

BonTerra CONSULTING

(Rev: 1-04-2012 JCD) PAS\Projects\CoLADPW\J162\Graphics\Bio\WPondTurtle\Ex2_SurveyResults.pdf

ATTACHMENT A

PHOTOGRAPHIC DOCUMENTATION

Big Tujunga Reservoir photographed from the dam.

Big Tujunga Creek facing upstream from the confluence with Big Tujunga Reservoir.

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Photographic Documentation — Attachment A-1

Western Pond Turtle Focused Survey for the Big Tujunga Reservoir Sediment Removal Project

BonTerra CONSULTING

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Western pond turtle recovered from Trap Station 3 (August 4, 2011).


Black bullhead schooling in Big Tujunga Reservoir.

ATTACHMENT B

WILDLIFE COMPENDIUM

WILDLIFE SPECIES OBSERVED DURING TURTLE TRAPPING

Species
Fish
ICTALURIDAE – CATFISH
*Ameiurus melas**   black bullhead
Reptiles
EMYDIDAE – WATER & BOX TURTLES
Emys marmorata   western pond turtle
*Trachemys scripta elegans**   red-eared slider
PHRYNOSOMATIDAE – ZEBRA-TAILED, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, & HORNED LIZARDS
Sceloporus occidentalis   western fence lizard
Uta stansburiana   side-blotched lizard
TEIIDAE – WHIPTAIL LIZARDS
Aspidoscelis [Cnemidophorus] tigris stejnegeri   coastal western whiptail
Birds
ANATIDAE – WATERFOWL
Anas platyrhynchos   mallard
PHALACROCORACIDAE – CORMORANTS
Phalacrocorax auritus   double-crested cormorant
ARDEIDAE – HERONS, BITTERNS, & ALLIES
Ardea herodias   great blue heron
ACCIPITRIDAE – HAWKS, KITES, EAGLES, & ALLIES
Buteo jamaicensis   red-tailed hawk
COLUMBIDAE - PIGEONS & DOVES
*Streptopelia chinensis **   spotted dove
TROCHILIDAE - HUMMINGBIRDS
Calypte anna   Anna's hummingbird
PICIDAE - WOODPECKERS
Colaptes auratus   northern flicker
TYRANNIDAE - TYRANT FLYCATCHERS
Sayornis nigricans   black phoebe
LANIIDAE - SHRIKES
Lanius ludovicianus   loggerhead shrike

WILDLIFE SPECIES OBSERVED DURING TURTLE TRAPPING (Continued)

Species
CORVIDAE - CROWS & JAYS
Aphelocoma californica western scrub-jay
Corvus brachyrhynchos American crow
HIRUNDINIDAE - SWALLOWS
Petrochelidon pyrrhonota cliff swallow
TROGLODYTIDAE - WRENS
Salpinctes obsoletus rock wren
Catherpes mexicanus canyon wren
PTILOGONATIDAE - SILKY-FLYCATCHERS
Phainopepla nitens phainopepla
CARDINALIDAE - CARDINALS & ALLIES
Pheucticus melanocephalus black-headed grosbeak
FRINGILLIDAE - FINCHES
Spinus [Carduelis] psaltria lesser goldfinch
* introduced species

ATTACHMENT C

CNDDB FORM

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/04/2011

For Office Use Only

Source Code ______ Quad Code ______
Elm Code ______ Occ. No. ______
EO Index No. ______ Map Index No. ______

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Emys marmorata*

Common Name: western pond turtle

Species Found? ☑ Yes ☐ No ______ If not, why?

Total No. Individuals 1 Subsequent Visit? ☑ yes ☐ no

Is this an existing NDDB occurrence? ______ Yes, Occ. # ☑ no ☐ unk.

Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: Sam Stewart

Address: 225 S. Lake Ave. Suite 1000
Pasadena, CA. 91101

E-mail Address: sstewart@bonterraconsulting.com

Phone: (626) 351-2000

Plant Information

Phenology: ___% vegetative ___% flowering ___% fruiting

Animal Information

# adults	# juveniles	# larvae	# egg masses	# unknown
	1			

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☑ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

County: Los Angeles Landowner / Mgr.: US Forest Service

Quad Name: Condor Peak Elevation: 2,230ft.

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Etrex Vista H

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy 10 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 391048, 3796189

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Western pond turtle caught in floating nylon funnel-trap set in Big Tujunga Reservoir. Juvenile turtle with carapace length of 13 cm. No other individuals observed during focused surveys at this location, within the reservoir, or for at least 1 km upstream during 5 trapping sessions. Scattered emergent alder present in shallows.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: No development in vicinity. Angeles National Forest.

Visible disturbances: None.

Threats: Introduced fish, amphibian, and turtle species, including black bullhead, American bullfrog (as indicated by dam operator), & red-eared slider.

Comments: Red-eared slider taken into captivity.

Determination: *(check one or more, and fill in blanks)*

- ☑ Keyed (cite reference): Stebbins 2003
- ☐ Compared with specimen housed at: ______
- ☐ Compared with photo / drawing in: ______
- ☐ By another person (name): ______
- ☐ Other: familiarity with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

APPENDIX B-7

2011 FOCUSED PLANT SURVEY LETTER REPORT

December 5, 2011

Mr. Philip Siongco
Water Resources Division
Department of Public Works
County of Los Angeles
900 South Fremont Avenue
Alhambra, California 91802-1460

VIA EMAIL AND U.S. MAIL
PSIONGCO@dpw.lacounty.gov

Subject: Results of 2011 Focused Plant Surveys for the Big Tujunga Reservoir Sediment Removal Project, Los Angeles County, California

Dear Mr. Siongco:

This Letter Report presents the findings of 2011 focused plant surveys conducted for the Big Tujunga Reservoir Sediment Removal Project (hereafter referred to as "the Proposed Project") in Los Angeles County, California (Exhibit 1).

Survey Area

Big Tujunga Canyon is located on the southern edge of the San Gabriel Mountains within the Angeles National Forest, and is located on the U.S. Geological Survey's (USGS') Condor Peak 7.5-minute topographic quadrangle at Township 3 North, Range 12 West, Sections 29, 31, and 32 (Exhibit 2). The survey area for special status plants consists of the proposed sediment removal area within the reservoir, the haul route downstream of Big Tujunga Dam, and the proposed fill areas within the existing Maple Canyon Sediment Placement Site (SPS) with a 100-foot buffer around these areas.

Topography in the survey area consists of sheer cliffs and steep slopes to the canyon bottom; elevations range from approximately 2,150 to 3,400 feet above mean sea level (msl). The survey area and surrounding vicinity consist of open space within the Angeles National Forest.

Soils in the survey area consist of Trigo; granitic substratum-Modjeska families association (5 to 60 percent slopes); Rock outcrop-Chilao family-Haploxerolls, warm association (15 to 120 percent slopes); Typic Xerorthents, warm (55 to 90 percent slopes); and Olete-Kilburn-Etsel families complex (50 to 80 percent slopes) (Exhibit 3).

METHODS

Botanical surveys were floristic in nature and conducted following the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009). A literature search was conducted to identify special status plants and habitats known to occur in the vicinity of the survey area. Sources reviewed include the USGS Sunland, Condor Peak, Chilao Flat, Burbank, Pasadena, and Mount Wilson 7.5-minute quadrangles in the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2011) and the California Department of Fish and Game's (CDFG's) California Natural Diversity Database (CNDDB) (CDFG 2011).

Reference populations were monitored for annual and difficult-to-detect target species to ensure that the scheduled surveys were comprehensive and conducted during the appropriate blooming period for these species, as shown in Table 1. Reference populations of CNPS List 3 and 4 species, and perennial species that are readily observable were not monitored. Known reference populations of Plummer's mariposa lily (*Calochortus plummerae*), California satintail (*Imperata brevifolia*), fragrant pitcher sage (*Lepechinia fragrans*), Davidson's bush-mallow (*Malacothamnus davidsonii*), and Greata's aster (*Symphyotrichum greatae*) were monitored to confirm their flowering status and to verify that project surveys were conducted during the appropriate blooming period for these species. Based on the reference survey results, the project surveys were conducted during a time frame when the target plant species were observable.

TABLE 1
SPECIAL STATUS PLANT SPECIES REFERENCE POPULATIONS

Species	Status	Date Checked	General Location
Malacothamnus davidsonii Davidson's bush-mallow	Flowering	April 20, 2011	Lower Big Tujunga Canyon, Sunland, California
Calochortus plummerae Plummer's mariposa lily	Flowering	June 9, 2011	Van Tassel Ridge, Azusa, California
Lepechinia fragrans fragrant pitcher sage	Flowering	June 13, 2011	Survey Area
Symphyotrichum greatae Greata's aster	Flowering	August 15, 2011	Monte Cristo Creek, Angeles National Forest
Imperata brevifolia California satintail	Flowering	August 26, 2011	Wildwood picnic area, Angeles National Forest

According to the National Weather Service (NWS), the region (data taken from Burbank) received 19.72 inches of precipitation this season (i.e., July 1, 2010–June 30, 2011), which is 113 percent of the average precipitation between 1971 and 2000 (NWS 2011). Rainfall was recorded at above-average levels throughout the Los Angeles Basin, with many areas receiving the highest rainfall since the 2005–2006 season (NWS 2011).

All potentially suitable habitats for special status plant species within the survey area were systematically surveyed during the site visits. Target species consisted of special status plant species known to occur in the vicinity and with potentially suitable habitat present in the survey area (Table 1). The special status plant species survey was conducted on April 20 and 27, 2011, by BonTerra Consulting Senior Botanist Robert Allen and Consulting Botanist David Bramlet; June 13, 2011, by Mr. Bramlet and Consulting Botanist Sandy Leatherman; and June 15, 16, and August 26, 2011, by Mr. Bramlet. The total number of person-hours spent was 69 hours.

All plant species observed were recorded in field notes. Plant species were identified in the field or collected for later identification. Plants were identified to the taxonomic level necessary to determine whether or not they are a special status species. Plants were identified using taxonomic keys, descriptions, and illustrations in Baldwin et al. (2011), Hickman (1993), and Munz (1974). Taxonomy and nomenclature follows Baldwin et al. (2011), Hickman (1993), and current scientific journals for scientific and common names.

For each special status species population observed, data was collected on the number and phenology of individuals and microsite characteristics such as slope, aspect, soil texture, surrounding habitat, and associated species.

SITE DESCRIPTION

The following vegetation types and land covers were observed in the survey area: coastal sage scrub, chaparral (with chamise chaparral, scrub oak chaparral, and mixed chaparral subassociations), California annual grassland, disturbed freshwater seep, riparian herb, willow riparian scrub, willow riparian forest, white alder – Fremont cottonwood – willow riparian forest, California sycamore woodland, coast live oak stands, bigcone Douglas-fir – canyon live oak woodland (forest), open water, streambed, cliff, and developed (Exhibit 4). Many of these areas were burned in the 2009 Station Fire, but are now recovering.

Coastal Sage Scrub

Coastal sage scrub vegetation is uncommon in the survey area, but was located near some of the disturbed areas below and adjacent to the dam. Common shrub species in this vegetation type include deerweed (*Acmispon glaber* [*Lotus scoparius*]), leafy California buckwheat (*Eriogonum fasciculatum* var. *foliolosum*), thick-leaved yerba santa (*Eriodictyon crassifolium*), poodle-dog bush (*Eriodictyon parryi* [*Turricula parryi*]), California-aster (*Corethrogyne filaginifolia* [*Lessingia filaginifolia*]), black sage (*Salvia mellifera*), white sage (*Salvia apiana*), and our Lord's candle (*Hesperoyucca whipplei* [*Yucca whipplei*]).

Chaparral

Chaparral vegetation is the most common vegetation type within the survey area, occurring along most canyon slopes. This vegetation type is highly variable and has been delineated into various subassociations. The following subassociations were observed in the survey area: (1) chamise chaparral; (2) scrub oak chaparral; and (3) mixed chaparral. Chamise chaparral occurs along most of the canyon slopes in the survey area. This vegetation type has a relatively open canopy and is dominated by the large shrubs chamise (*Adenostoma fasciculatum var. fasciculatum*) and thick-leaved yerba santa. Scrub oak chaparral occurs on the north-facing slopes in the Maple Canyon SPS and on some slopes above the dam. This vegetation type is dominated by scrub oak (*Quercus berberidifolia*) in some areas that were previously burned and is currently regrowing; other areas are dominated by canyon live oak (*Quercus chrysolepis*). The understory includes species such as California poppy (*Eschscholzia californica*), ripgut brome (*Bromus diandrus*), and foxtail chess (*Bromus madritensis* ssp. *rubens*). Mixed chaparral occurs on canyon slopes throughout the survey area. These areas contain a mix of chaparral species, and vegetative cover is sparser than in the chamise chaparral with more exposed rock and bare ground present. Most of the slopes on which this vegetation type is found burned during the 2009 Station Fire and shrubs and trees are commonly sprouting from the base.

California Annual Grassland

California annual grassland occurs between the switchbacks of the access roads near the entrance to the dam facilities and the Maple Canyon SPS. This area has been previously used to deposit sediment from the reservoir. This vegetation type is dominated by a variety of non-native grasses including ripgut brome, foxtail chess, and wild oat (*Avena* sp.). Some scattered California poppy, Spanish broom (*Spartium junceum*), scrub oak, and pine (*Pinus* sp.) are also present.

Disturbed Freshwater Seep

Disturbed freshwater seep occurs downstream of Big Tujunga Reservoir on the slope north of the canyon bottom. While there is an underlying native component of species such as thick-leaved yerba santa, stream orchid (*Epipactis gigantea*), cryptantha (*Cryptantha* sp.), and deerweed, the area contains a large proportion of non-native species such as crofton weed

(*Ageratina adenophora*), Mediterranean schismus (*Schismus barbatus*), fescue (*Festuca* sp. [*Vulpia* sp.]), foxtail chess, ripgut brome, wild oat, red-stemmed filaree (*Erodium cicutarium*), and tree tobacco (*Nicotiana glauca*).

Riparian Herb

Riparian herb vegetation occurs along the canyon bottom above Big Tujunga Reservoir. This vegetation type is generally dominated by herbaceous species such as seep monkeyflower (*Mimulus guttatus*), bentgrass (*Agrostis* sp.), smilo grass (*Piptatherum miliaceum*), long-leaved rush (*Juncus macrophyllus*), great marsh evening primrose (*Oenothera elata*), great water speedwell (*Veronica anagallis-aquatica*), water cress (*Nasturtium officinale* [*Rorippa nasturtium-aquaticum*]), common beggar-ticks (*Bidens pilosa*), annual beard grass (*Polypogon monspeliensis*), willow weed (*Persicaria lapathifolia* [*Polygonum lapathifolium*]), crofton weed, white sweetclover (*Melilotus alba*), scarlet monkeyflower (*Mimulus cardinalis*), barnyard grass (*Echinochloa crus-galli*), false daisy (*Eclipta prostrata*), and tall umbrella-sedge (*Cyperus eragrostis*).

Willow Riparian Scrub

Willow riparian scrub occurs along the canyon bottom and up some side drainages above Big Tujunga Reservoir. This vegetation type is dominated by arroyo willow (*Salix lasiolepis*) and mule fat (*Baccharis salicifolia*) with lesser amounts of red willow (*Salix laevigata*) and black willow (*Salix gooddingii*). The understory contains western poison oak (*Toxicodendron diversilobum*), mugwort (*Artemisia douglasiana*), branching phacelia (*Phacelia ramosissima*), crofton weed, and white sweetclover.

Willow Riparian Forest

Willow riparian forest occurs at the canyon bottom downstream of the dam. This vegetation type is dominated by a mix of arroyo willow and Goodding's black willow with an understory containing tree tobacco, ripgut brome, and chaparral nightshade (*Solanum xanti*). A few scattered white alder (*Alnus rhombifolia*) and Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) are also present. This vegetation type burned during the 2009 Station Fire, and willow trees are re-sprouting from the base.

White Alder – Fremont Cottonwood – Willow Riparian Forest

White alder – Fremont cottonwood – willow riparian forest occurs along some side drainages above Big Tujunga Reservoir. This vegetation type is composed of white alder, Fremont cottonwood, red willow, black willow, and Pacific willow (*Salix lasiandra* var. *lasiandra* [*Salix lucida* ssp. *lasiandra*]), with some tall arroyo willows.

California Sycamore Woodland

California sycamore woodland occurs in smaller drainages within the Maple Canyon SPS. This vegetation type is dominated by scattered stands of California sycamore with arroyo willow, black willow, and red willow in the overstory. Other shrubs and perennial herbs in the understory consist of California brickellbush (*Brickellia californica*), narrow-leaved fuchsia (*Epilobium canum*), branching phacelia, everlasting (*Pseudognaphalium canescens* [*Gnaphalium canescens*]), seep monkeyflower, bentgrass, and showy monkeyflower (*Mimulus floribundus*).

Coast Live Oak Stands

A few stands of coast live oak individuals occur in the survey area. The stand along the access road leading to the Maple Canyon SPS has an understory of chamise, thick-leaved yerba santa, our Lord's candle, black sage, deerweed, and chaparral nightshade. The stand along the access road downstream of the dam contains a sparse understory of non-native grasses with much bare ground. No significant fire damage to oak trees was noted during the field survey.

Bigcone Douglas-fir – Canyon Live Oak Woodland (Forest)

Bigcone Douglas-fir – canyon live oak woodland (forest) occurs on the steep slopes above Big Tujunga Reservoir. This vegetation type is dominated by bigcone Douglas-fir (*Pseudotsuga macrocarpa*) and canyon live oak. This area was inaccessible during the surveys, but other species expected to be present include those found in the mixed chaparral, such as scrub oak and birch-leaf mountain-mahogany (*Cercocarpus betuloides* var. *betuloides*).

Open Water

Open water occurs upstream of Big Tujunga Dam along the active channel. Water levels were high during the initial survey and made much of the canyon (upstream of the dam) inaccessible. Water levels decreased over the course of the season, and the areas above the dam were more accessible. Open water downstream of the dam that was flowing through the willow riparian forest is not included in this category because of the willow canopy and relatively limited extent of open water.

Streambed

Areas mapped as streambed are the portions of Big Tujunga Creek that are currently unvegetated and adjacent to the current active channel. Some of the areas consist of gravel or sandbars while other areas contain woody debris or sediment deposits. Some scattered vegetation, including old "islands" of broad-leaved cattail (*Typha latifolia*) or germinating herbaceous species, are also present in the streambed; these vegetated areas are too small and patchy to be mapped separately.

Cliff

Cliff faces occur on the steep slopes throughout the survey area. These areas are rocky and largely unvegetated. No impacts are expected to this vegetation type as it occurs outside of the proposed sediment excavation limits.

Ornamental

Ornamental plantings along the existing roads include common oleander (*Nerium oleander*), gum (*Eucalyptus* sp.), pine, and coast live oak.

Developed

Developed areas occur throughout the lower portion of the survey area. This consists of the dam facilities, access roads, debris piles, concrete canyon walls, and riprap.

SURVEY RESULTS

Four special status plant species were observed during focused surveys: Plummer's mariposa lily, fragrant pitcher sage, San Gabriel oak, and Greata's aster. Table 2 summarizes the survey results and characterizes the habitat suitability for each special status plant species in the survey area. A list of all plants observed during the 2011 surveys is included in Appendix A.

Special status plant observations are discussed in more detail below and are shown in Exhibit 5. Voucher specimens were collected and deposited in the herbarium at Rancho Santa Ana Botanical Gardens. Representative photographs of each species are included in Appendix B. Details on individual populations are included in Appendix C. A CNDDB Field Survey Form for each species' occurrences is included in Appendix D.

TABLE 2
SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR IN THE VICNITY OF THE SURVEY AREA

Species	Status[a]				Likelihood for Occurrence
	USFWS	CDFG	CNPS	USFS	
Astragalus brauntonii Braunton's milk-vetch	FE	—	1B.1	—	Not expected to occur; outside known range.
Atriplex parishii Parish's brittlescale	—	—	1B.1	—	Not expected to occur; no suitable habitat.
Berberis nevinii Nevin's barberry	FE	SE	1B.1	—	May occur; potentially suitable habitat. Not observed during focused surveys.
California macrophylla round-leaved filaree	—	—	1B.1	—	Not expected to occur; no suitable habitat.
Calochortus clavatus var. *gracilis* slender mariposa lily	—	—	1B.2	FSS	May occur; potentially suitable habitat. Not observed during focused surveys.
Calochortus plummerae **Plummer's mariposa lily**	**—**	**—**	**1B.2**	**FSS**	**Suitable habitat present. Observed during focused surveys.**
Calochortus striatus alkali mariposa lily	—	—	1B.2	FSS	Not expected to occur; no suitable habitat; outside known range.
Castilleja gleasonii Mount Gleason paintbrush	—	SR	1B.2	FSS	Not expected to occur; no suitable habitat; outside known range.
Centromadia parryi ssp. *australis* southern tarplant	—	—	1B.1	—	Not expected to occur; no suitable habitat.
Chorizanthe parryi var. *fernandina* San Fernandino Valley spineflower	FC	SE	1B.1	FSS	Not expected to occur; outside known range.
Chorizanthe parryi var. *parryi* Parry's spineflower	—	—	1B.1	FSS	May occur; potentially suitable habitat. Not observed during focused surveys.
Cladium californicum California saw-grass	—	—	2.2	—	May occur; potentially suitable habitat. Not observed during focused surveys.
Dodecahema leptoceras slender-horned spineflower	FE	SE	1B.1	—	Not expected to occur; no suitable habitat.
Dudleya multicaulis many-stemmed dudleya	—	—	1B.2	FSS	Not expected to occur; no suitable habitat.
Galium grande San Gabriel bedstraw	—	—	1B.2	FSS	Not expected to occur; no suitable habitat.
Helianthus nuttallii ssp. *parishii* Los Angeles sunflower	—	—	1A	—	Not expected to occur; no suitable habitat; presumed extinct.
Horkelia cuneata ssp. *puberula* mesa horkelia	—	—	1B.1	FSS	May occur; potentially suitable habitat. Not observed during focused surveys.
Imperata brevifolia California satintail	—	—	2.1	FSS	May occur; potentially suitable habitat. Not observed during focused surveys.

TABLE 2 (Continued)
SPECIAL STATUS PLANT SPECIES KNOWN TO OCCUR IN THE VICNITY OF THE SURVEY AREA

Species	Status[a]				Likelihood for Occurrence
	USFWS	CDFG	CNPS	USFS	
Lasthenia glabrata ssp. *coulteri* Coulter's goldfields	—	—	1B.1	—	Not expected to occur; no suitable habitat.
Lepechinia fragrans **fragrant pitcher sage**	**—**	**—**	**4.2**	**FSS**	**Suitable habitat present. Observed during focused surveys.**
Lepidium virginicum var. *robinsonii* Robinson's pepper-grass	—	—	1B.2	—	Not expected to occur; no suitable habitat.
Linanthus concinnus San Gabriel linanthus	—	—	1B.2	FSS	Not expected to occur; outside known elevational range.
Malacothamnus davidsonii Davidson's bush-mallow	—	—	1B.2	—	May occur; potentially suitable habitat. Not observed during focused surveys.
Muhlenbergia californica California muhly	—	—	4.3	—	Not expected to occur; no suitable habitat.
Opuntia basilaris var. *brachyclada* short-joint beavertail	—	—	1B.2	—	Not expected to occur; no suitable habitat.
Pseudognaphalium leucocephalum white rabbit-tobacco	—	—	2.2	—	May occur; potentially suitable habitat. Not observed during focused surveys.
Quercus durata* var. *gabrielensis **San Gabriel oak**	**—**	**—**	**4.2**	—	**Suitable habitat present. Observed during focused surveys.**
Ribes divaricatum var. *parishii* Parish's gooseberry	—	—	1A	—	Not expected to occur; no suitable habitat; presumed extinct.
Symphyotrichum greatae **Greata's aster**	**—**	**—**	**1B.3**	—	**Suitable habitat present. Observed during focused surveys.**
Symphyotrichum defoliatum San Bernardino aster	—	—	1B.2	FSS	May occur; potentially suitable habitat. Not observed during focused surveys.
Thelypteris puberula var. *sonorensis* Sonoran maiden fern	—	—	2.2	FSS	May occur; potentially suitable habitat. Not observed during focused surveys.

[a] **Status Definitions**

Federal (USFWS)		State (CDFG)		Federal (USFS)	
FE	Endangered	SE	Endangered	FSS	Forest Service Sensitive
FC	Candidate	SR	Rare		

California Native Plant Society (CNPS) List Categories
List 1A Plants Presumed Extinct in California
List 1B Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2 Plants Rare, Threatened, or Endangered in California But More Common Elsewhere
List 4 Plants of Limited Distribution – A Watch List

California Native Plant Society (CNPS) Threat Code Extensions
None Plants lacking any threat information
.1 Seriously Endangered in California (over 80% of occurrences threatened; high degree and immediacy of threat)
.2 Fairly Endangered in California (20–80% of occurrences threatened)
.3 Not Very Threatened in California (low degree/immediacy of threat or no current threats known)

Agency Abbreviations:
CDFG: California Department of Fish and Game
CNPS: California Native Plant Society
USFS: United States Forest Service
USFWS: United States Fish and Wildlife Service

PROJECT IMPACTS

A preliminary discussion of project impacts is presented below. The proposed impact area is still being developed and may change prior to issuance of the project's environmental document. Table 3 summarizes the Proposed Project's potential impact on special status plant species that were observed during the survey.

TABLE 3
SUMMARY OF SPECIAL STATUS PLANT SPECIES OCCURRENCES WITHIN SURVEY AREA

Species	Number of Occurrences		Total Individual Plants		Mitigation Required
	Within Survey Area	Within Impact Boundary	Within Survey Area	Within Impact Boundary	
Calochortus plummerae Plummer's mariposa lily	5	2 (40%)	30	25 (83%)	yes, if impacted[1]
Lepechinia fragrans fragrant pitcher sage	3	3 (100%)	14	14 (100%)	yes, if impacted[1]
Symphyotrichum greatae Greata's aster	2	0 (0%)	5	0 (0%)	no[2]
Quercus durata var. *gabrielensis* San Gabriel oak	3	3 (100%)	48	48 (100%)	no[3]

[1] Plummer's mariposa lily and fragrant pitcher plant occur in portions of the Maple Canyon SPS, but outside of the expected footprint for sediment placement.
[2] Greata's aster is located adjacent to the route for transporting sediment to Maple Canyon SPS and no impacts are expected to this species.
[3] San Gabriel oak is a CNPS List 4 species. Impacts to List 4 species do not typically require mitigation under CEQA. This species is also located outside of the expected footprint for sediment placement.

Plummer's Mariposa Lily

Plummer's mariposa lily is a CNPS List 1B.2 species and is listed as a sensitive species for the Angeles National Forest by the U.S. Forest Service (USFS). It typically blooms between May and July (CNPS 2011). This perennial bulbiferous herb occurs in coastal sage scrub; dry, rocky chaparral; and yellow-pine forest at elevations between sea level and approximately 5,580 feet above msl (Baldwin et al. 2011). This species is known from the South Coast and Peninsular Ranges (Baldwin et al. 2011). Thirty individuals were observed in five populations in the survey area on rocky cliff faces and burned chaparral (Exhibit 5). Three populations are located along the haul route between Big Tujunga Reservoir and the Maple Canyon SPS, and two others are in the extreme upper portions of the Maple Canyon SPS. The plants along the haul route are not expected to be affected by the Proposed Project because no ground disturbing activities are planned for this area. The populations located within the Maple Canyon SPS are not expected to be impacted as they occur outside of the expected footprint for sediment placement. Potential impacts on Plummer's mariposa lily would be considered potentially significant under the California Environmental Quality Act (CEQA), and therefore, may require mitigation. Additionally, Plummer's mariposa lily is listed as USFS Sensitive by the Angeles National Forest; therefore, impacts to this species may require mitigation under the National Environmental Policy Act (NEPA) and/or as a condition of a USFS Special Use Permit for the Proposed Project.

Fragrant Pitcher Sage

Fragrant pitcher sage is a CNPS List 4.2 species and is listed as a sensitive species for the Angeles National Forest by the U.S. Forest Service (USFS). It typically blooms between March and October (CNPS 2011). This perennial shrub occurs in chaparral vegetation at elevations between sea level and approximately 4,265 feet above msl (Baldwin et al. 2011). It is known from the Western Transverse Ranges, the San Gabriel Mountains, the South Coast, and the northern Channel Islands (Baldwin et al. 2011). Fourteen individuals were observed in three populations in the survey area (Exhibit 5) in mixed-scrub oak chaparral and coastal sage scrub in the survey area. These populations are located in the Maple Canyon SPS though no impacts are expected as these populations are located outside of the planned footprint for sediment placement. Fragrant pitcher sage is listed as USFS Sensitive by the Angeles National Forest; therefore, impacts to this species may require mitigation under the NEPA and/or as a condition of a USFS Special Use Permit for the Proposed Project.

Greata's Aster

Greata's aster is a CNPS List 1B.3 species. It typically blooms between June and October (CNPS 2011). This rhizomatous perennial herb occurs in damp places in canyons at elevations between approximately 985 and 6,560 feet above msl (Baldwin et al. 2011). It is known from the south slopes of the San Gabriel Mountains (Baldwin et al. 2011). Five individuals were observed in two populations in freshwater seep in the survey area (Exhibit 5). These populations are located along the haul route between Big Tujunga Reservoir and the Maple Canyon SPS and are not expected to be affected by the proposed Project because no ground disturbing activities are planned for this area. Therefore, no mitigation would be necessary.

San Gabriel Oak

San Gabriel oak is a CNPS List 4.2 species. It occurs on granitic soil in chaparral at elevations between approximately 1,475 and 3,280 feet above msl (Baldwin et al. 2011). It is known from the southeast Western Transverse Ranges and south slopes of the San Gabriel Mountains (Baldwin et al. 2011). Forty-eight individuals were observed in three populations in the Maple Canyon SPS in mixed chaparral, chamise chaparral, and burned mixed chaparral (Exhibit 5). These populations are located outside of the expected footprint for sediment placement and no impacts are anticipated. This species is on a "watch list" for plants of limited distribution. Due to the relatively common distribution of this species in the region, any potential impacts are not expected to reduce its regional populations to below self-sustaining levels. Therefore, potential impacts would likely be considered adverse but less than significant under CEQA and mitigation would not be required.

RECOMMENDATIONS

Recommended mitigation measures for Plummer's mariposa lily and fragrant pitcher sage include the following:

- ***Avoidance.*** Populations shall be avoided to the extent possible.

- ***Compensation.*** If avoidance is not possible, a potential mitigation strategy is the off-site purchase of mitigation sites that contain substantial populations of the species in question. The potential mitigation sites shall be in open spaces and shall be permanently preserved to complement existing open space areas.

- ***Propagation.*** If avoidance and compensation are not viable options, then a program will be developed to collect and transplant seeds/bulbs to an appropriate mitigation site. A mitigation plan would be developed to include the following topics: (1) identification of an appropriate mitigation site; (2) methods of seed/bulb collection and application/transplant; (3) methods for site maintenance and monitoring; and (4) a description of performance standards that will indicate successful completion of the mitigation program.

Recommended mitigation measures for San Gabriel oak include the following:

- ***Avoidance.*** Populations shall be avoided to the extent possible.

- ***Propagation.*** If avoidance is not a viable option, then a program should be developed to collect acorns from San Gabriel oaks within the impact area for use in revegetation efforts associated with the Proposed Project's mitigation requirements. Possible future threats to on-site preserved special status species include horticultural plant collection, access road widening and maintenance, fire clearance, additional sediment removal, fire, erosion, and increased distribution of non-native invasive plant species. Any special status plants preserved on site should be protected from these threats to the extent practicable through the use of best management practices to minimize fire, erosion, and the spread of invasive non-native plant species.

If you have any comments or questions, please call David Hughes at (626) 351-2000.

Sincerely,

BONTERRA CONSULTING

Stan Ct

for David T. Hughes
Senior Project Manager

for Alwin D Rudeberg

for Robert L. Allen
Senior Botanist

Enclosures: Exhibit 1 – Project Location
Exhibit 2 – U.S. Geological Survey 7.5-Minute Quadrangle
Exhibit 3 – Soil Types
Exhibit 4 – Vegetation Types and Other Areas
Exhibit 5 – Special Status Plant Species Locations
Appendix A – Plant Compendium
Appendix B – Special Status Plant Photographs
Appendix C – Special Status Plant Population Details
Appendix D – California Natural Diversity Database Forms

cc: David Bramlet
Sandy Leatherman

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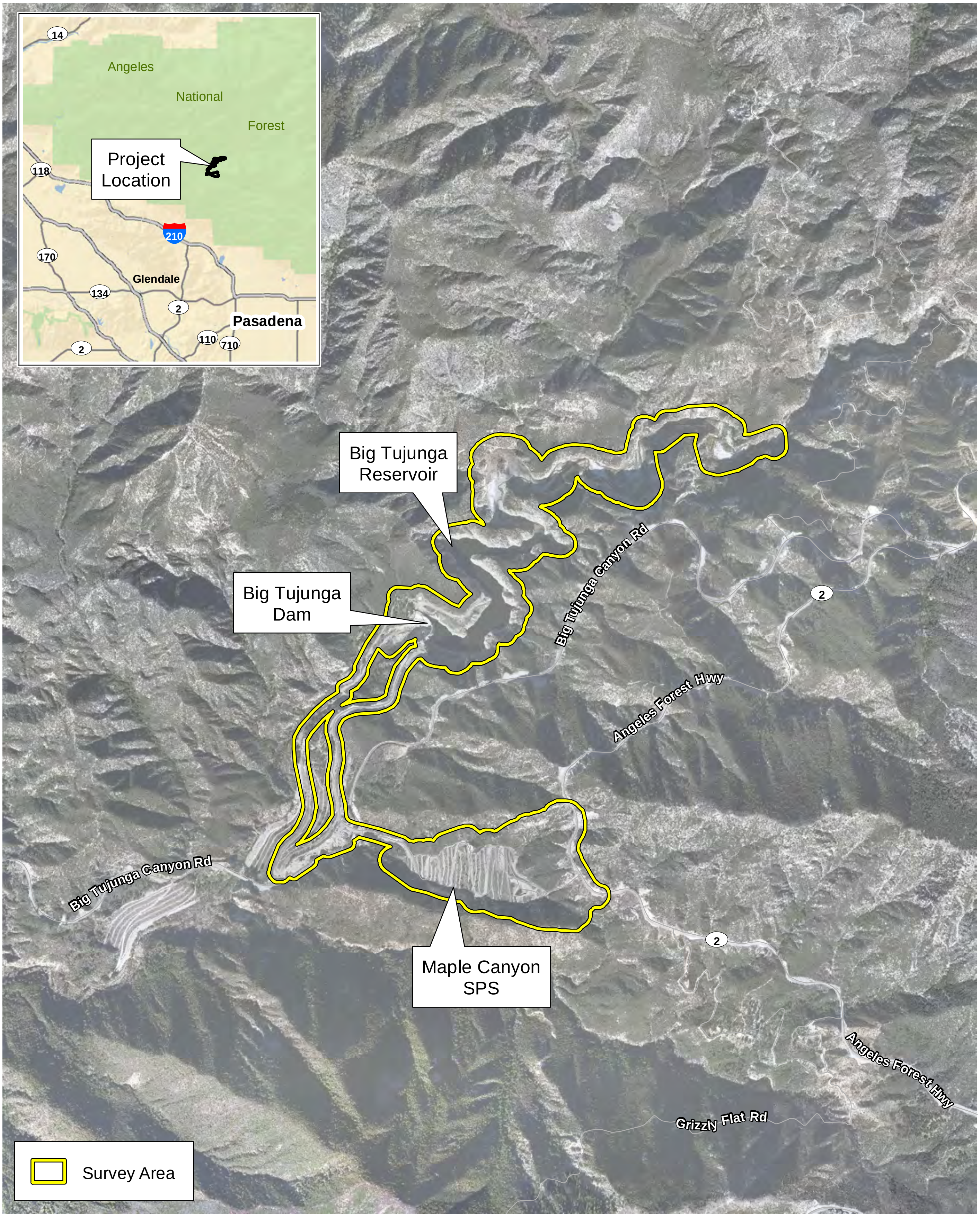

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Project Location

Exhibit 1

Big Tujunga Reservoir Sediment Removal Project

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Feet

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CONSULTING

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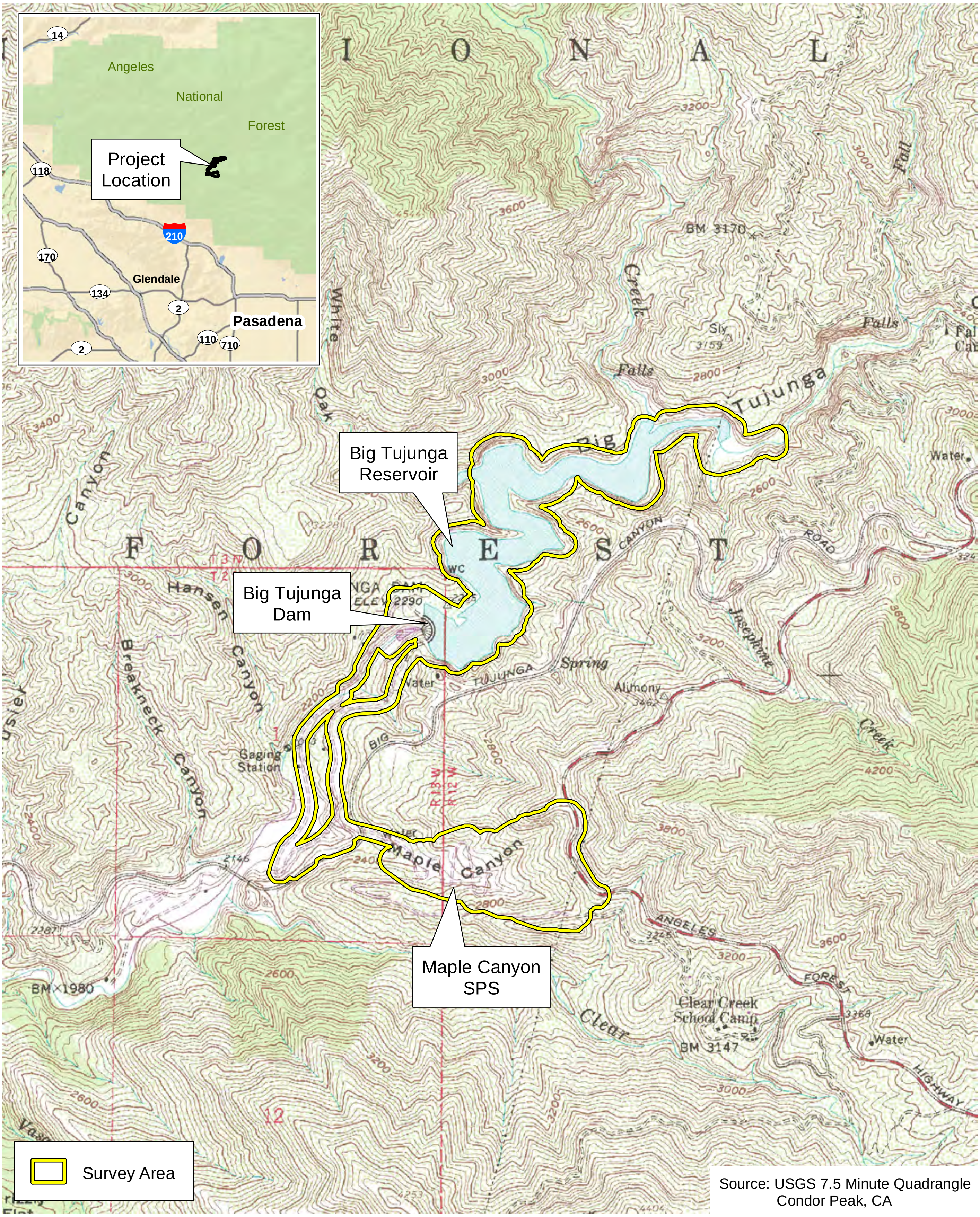

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U.S. Geological Survey 7.5-Minute Quadrangle

Exhibit 2

Big Tujunga Reservoir Sediment Removal Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

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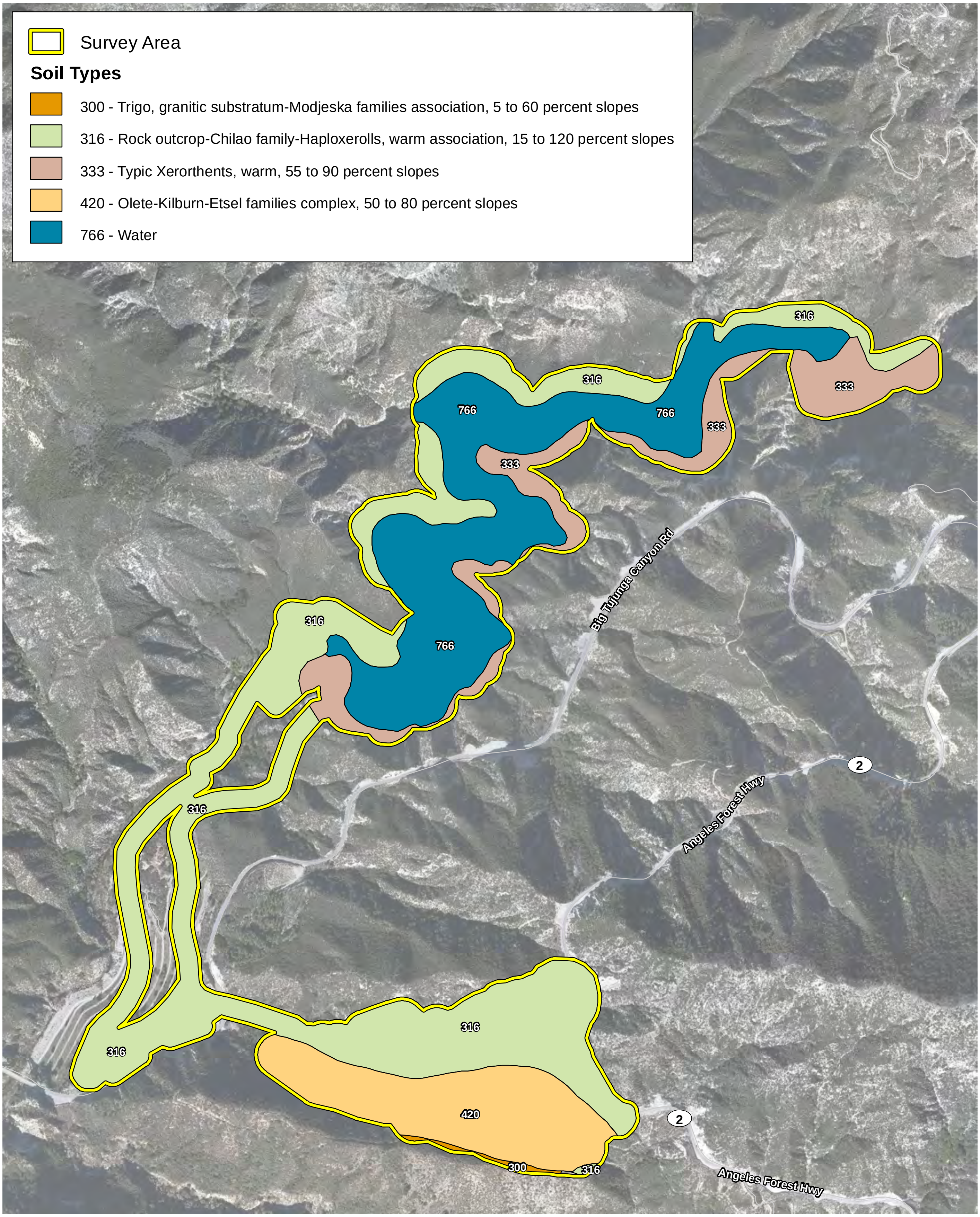

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Soil Types

Exhibit 3

Big Tujunga Reservoir Sediment Removal Project

N W E S

1,200 600 0 1,200
Feet

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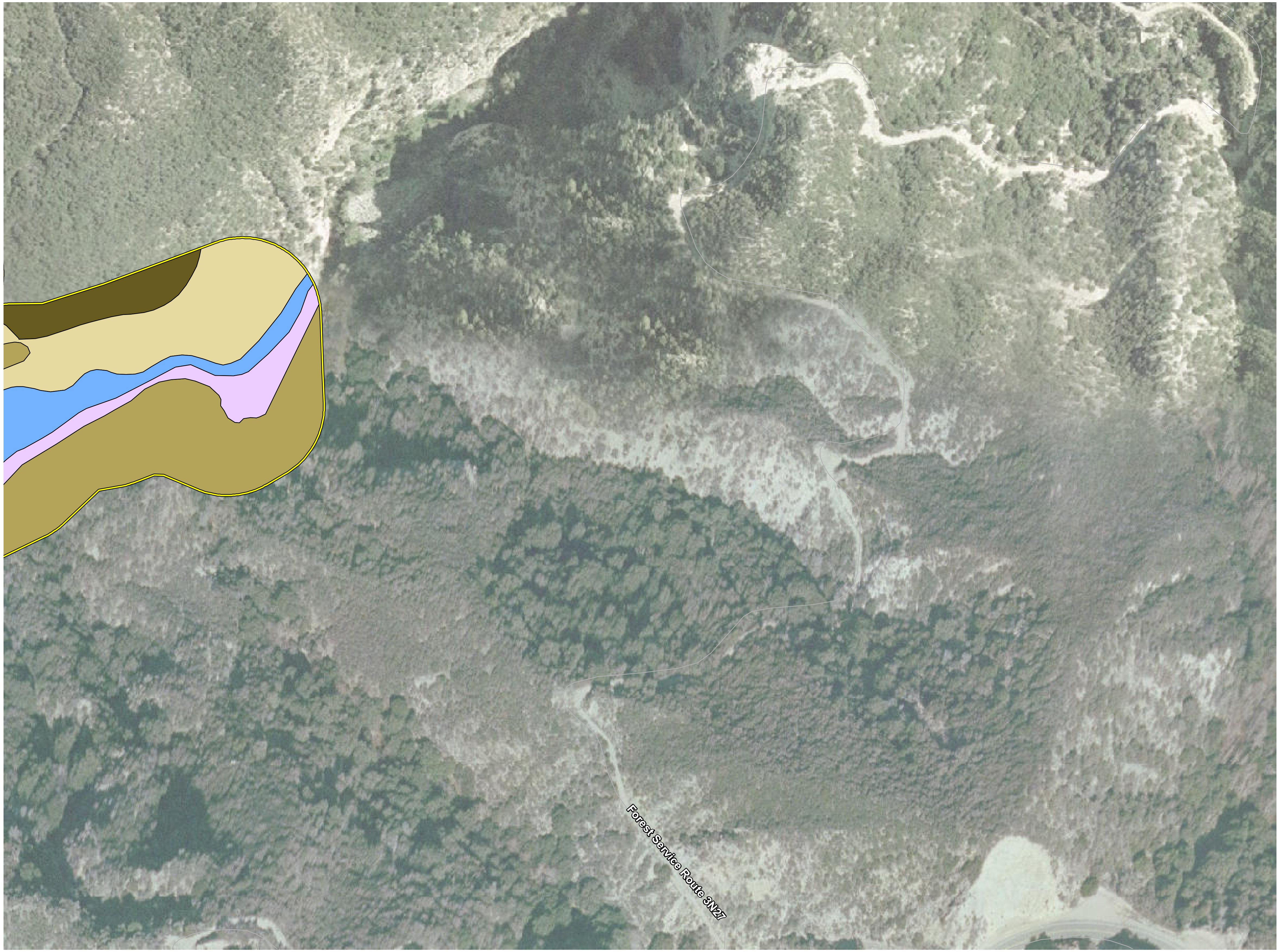
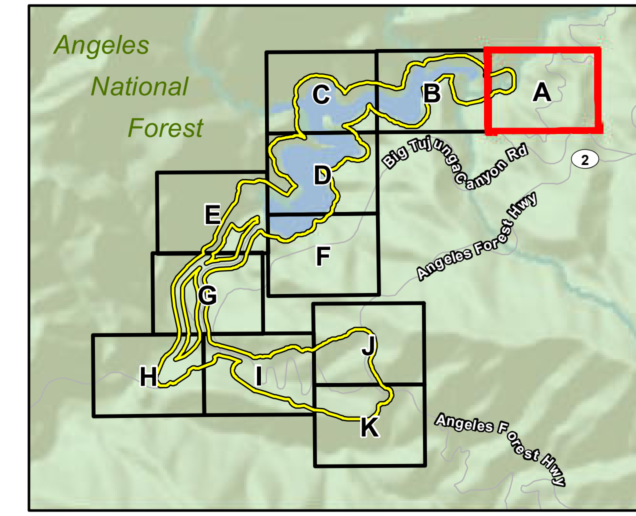
(Rev: 10-10-2011 JCD) R:\PAS\Projects\CoLADPWJ162\Graphics\Bio\Constraints\Plant\Ex3_soils.pdf





Survey Area

Vegetation Types and Other Areas

- Coastal Sage Scrub
- Chamise Chaparral
- Scrub Oak Chapparal
- Mixed Chaparral
- California Annual Grassland
- Disturbed Freshwater Seep
- Riparian Herb
- Willow Riparian Forest
- Willow Riparian Scrub
- White Alder - Fremont Cottonwood - Willow Riparian Forest
- Coast Live Oak Stands
- Bigcone Douglas Fir - Canyon Live Oak Woodland (Forest)
- Open Water
- Streambed
- Cliff
- Ornamental
- Developed

D:\Projects\CoLADPW\J162\MXD\ex_veg.mxd

Vegetation Types and Other Areas

Exhibit 4A

Big Tujunga Reservoir Sediment Removal Project

N W E S

200 100 0 200 Feet

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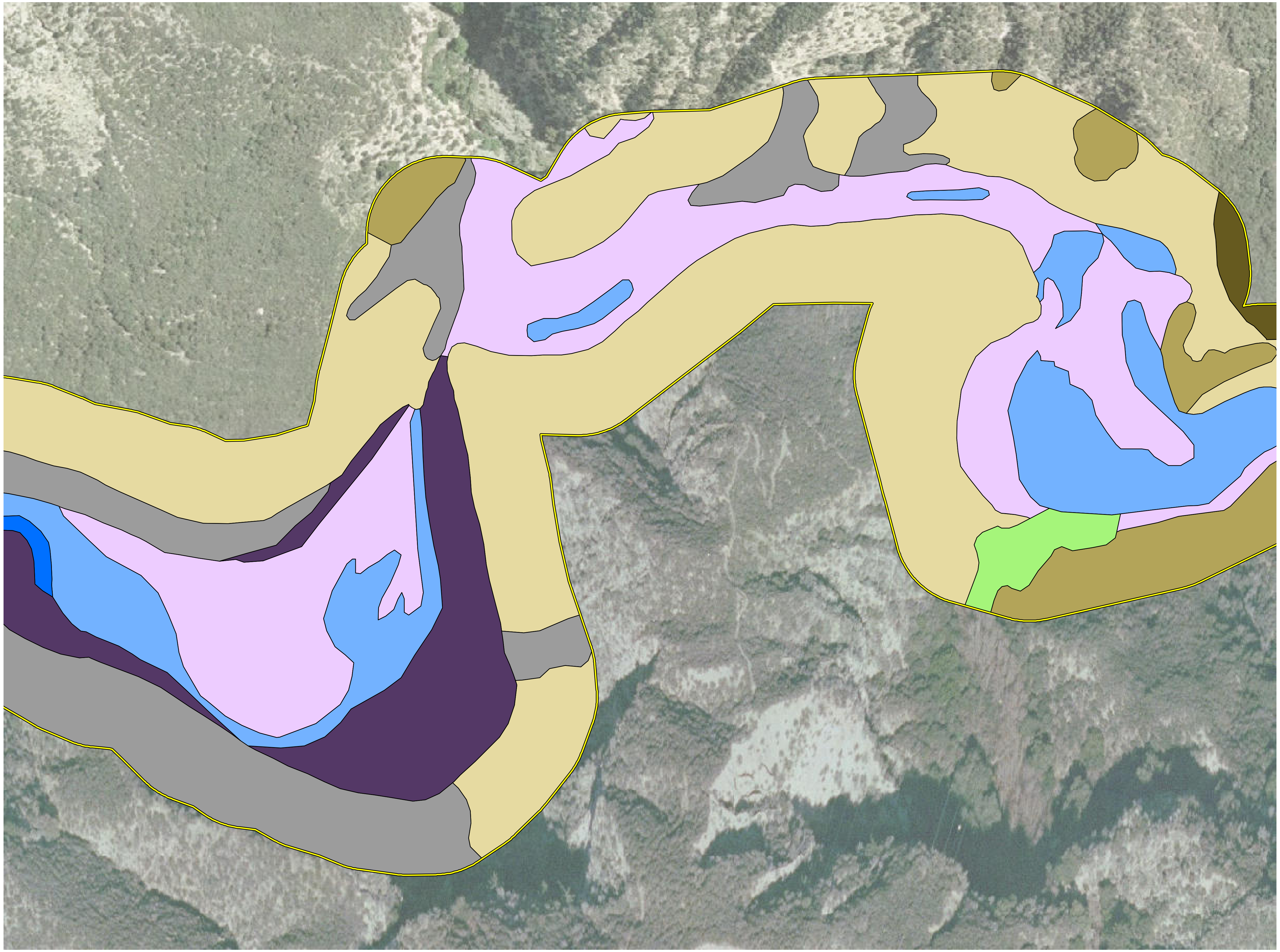

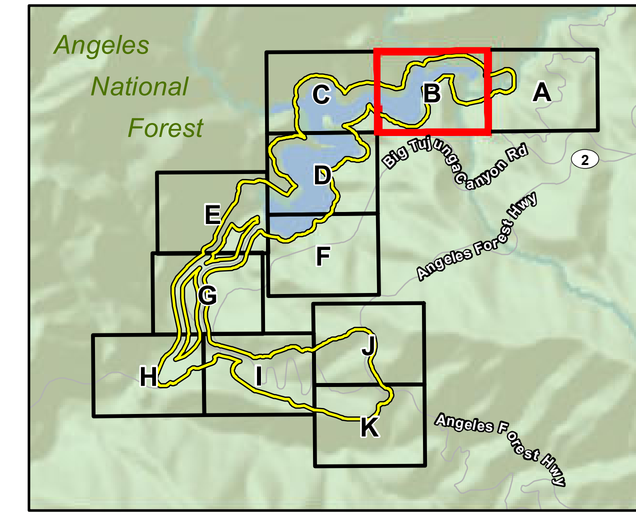

Survey Area

Vegetation Types and Other Areas

- Coastal Sage Scrub
- Chamise Chaparral
- Scrub Oak Chapparal
- Mixed Chaparral
- California Annual Grassland
- Disturbed Freshwater Seep
- Riparian Herb
- Willow Riparian Forest
- Willow Riparian Scrub
- White Alder - Fremont Cottonwood - Willow Riparian Forest
- Coast Live Oak Stands
- Bigcone Douglas Fir - Canyon Live Oak Woodland (Forest)
- Open Water
- Streambed
- Cliff
- Ornamental
- Developed

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Vegetation Types and Other Areas

Exhibit 4B

Big Tujunga Reservoir Sediment Removal Project

N W E S

200 100 0 200
Feet

BonTerra CONSULTING

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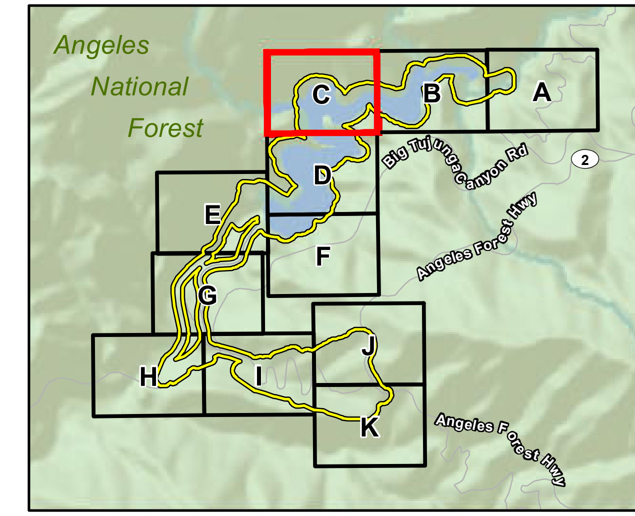

Survey Area

Vegetation Types and Other Areas

- Coastal Sage Scrub
- Chamise Chaparral
- Scrub Oak Chapparal
- Mixed Chaparral
- California Annual Grassland
- Disturbed Freshwater Seep
- Riparian Herb
- Willow Riparian Forest
- Willow Riparian Scrub
- White Alder - Fremont Cottonwood - Willow Riparian Forest
- Coast Live Oak Stands
- Bigcone Douglas Fir - Canyon Live Oak Woodland (Forest)
- Open Water
- Streambed
- Cliff
- Ornamental
- Developed

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Vegetation Types and Other Areas

Exhibit 4C

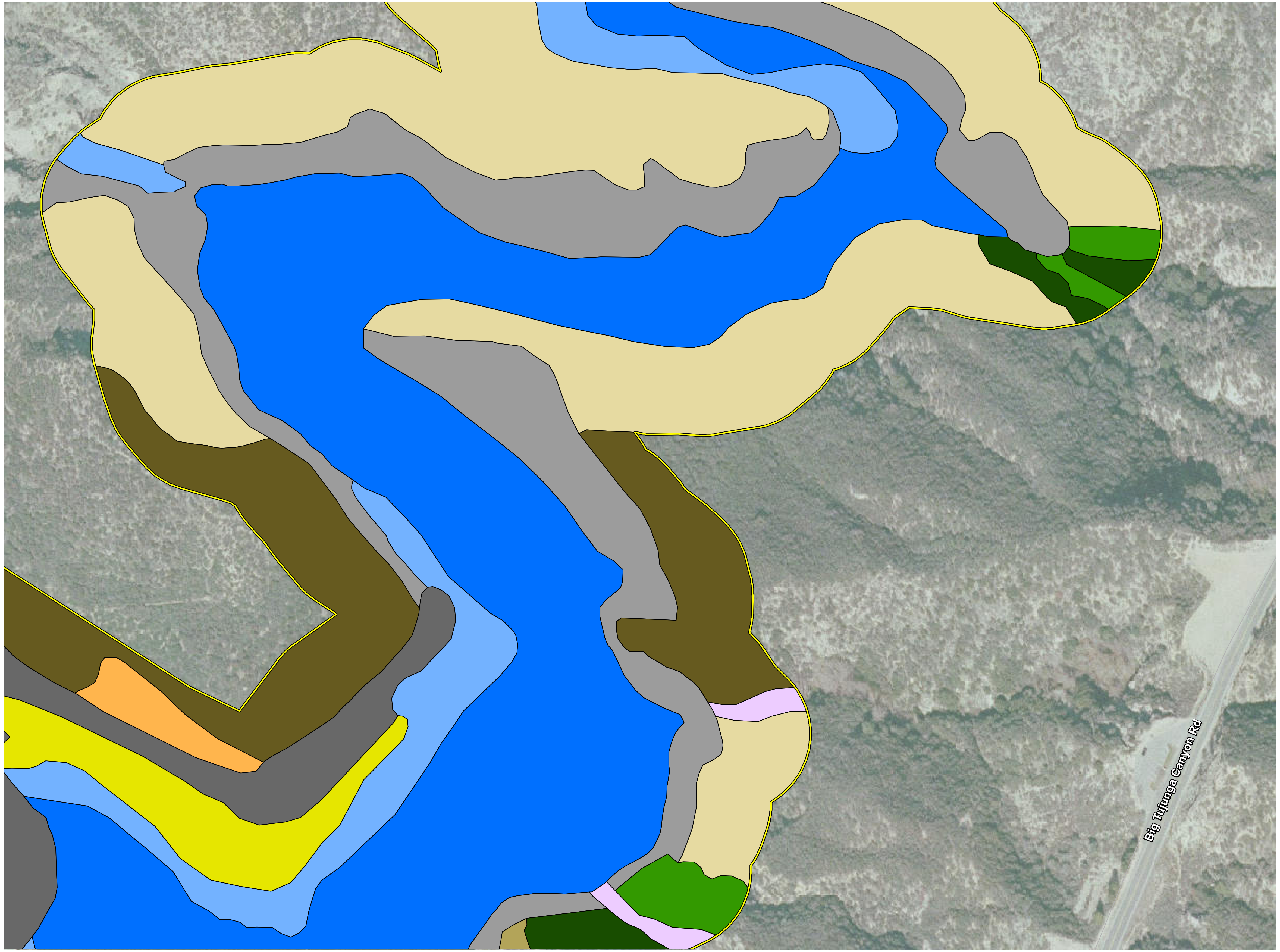
Big Tujunga Reservoir Sediment Removal Project

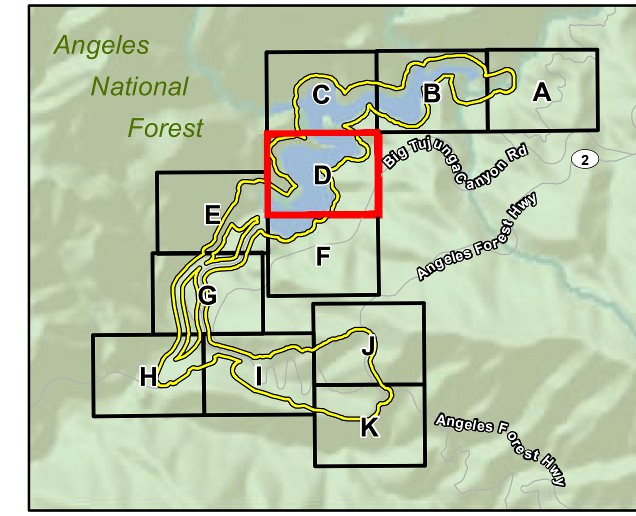
N W E S

200 100 0 200 Feet

BonTerra CONSULTING

(Rev: 10-12-2011 JCD) R:\PAS\Projects\CoLADPWJ162\Graphics\Bio\Constraints\Plant\Ex4_veg.pdf





Survey Area

Vegetation Types and Other Areas

- Coastal Sage Scrub
- Chamise Chaparral
- Scrub Oak Chapparal
- Mixed Chaparral
- California Annual Grassland
- Disturbed Freshwater Seep
- Riparian Herb
- Willow Riparian Forest
- Willow Riparian Scrub
- White Alder - Fremont Cottonwood - Willow Riparian Forest
- Coast Live Oak Stands
- Bigcone Douglas Fir - Canyon Live Oak Woodland (Forest)
- Open Water
- Streambed
- Cliff
- Ornamental
- Developed

D:\Projects\CoLADPW\J162\MXD\ex_veg.mxd

Vegetation Types and Other Areas

Exhibit 4D

Big Tujunga Reservoir Sediment Removal Project

N W E S

200 100 0 200
Feet

BonTerra CONSULTING

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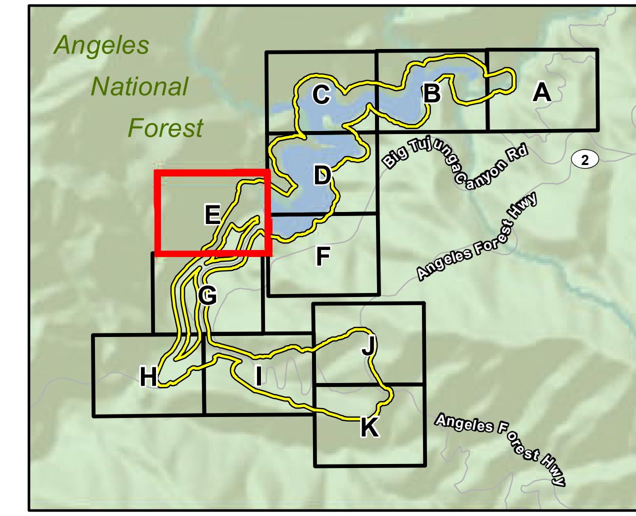


Survey Area

Vegetation Types and Other Areas

- Coastal Sage Scrub
- Chamise Chaparral
- Scrub Oak Chapparal
- Mixed Chaparral
- California Annual Grassland
- Disturbed Freshwater Seep
- Riparian Herb
- Willow Riparian Forest
- Willow Riparian Scrub
- White Alder - Fremont Cottonwood - Willow Riparian Forest
- Coast Live Oak Stands
- Bigcone Douglas Fir - Canyon Live Oak Woodland (Forest)
- Open Water
- Streambed
- Cliff
- Ornamental
- Developed

D:\Projects\CoLADPWJ162\MXD\ex_veg.mxd

Vegetation Types and Other Areas

Exhibit 4E

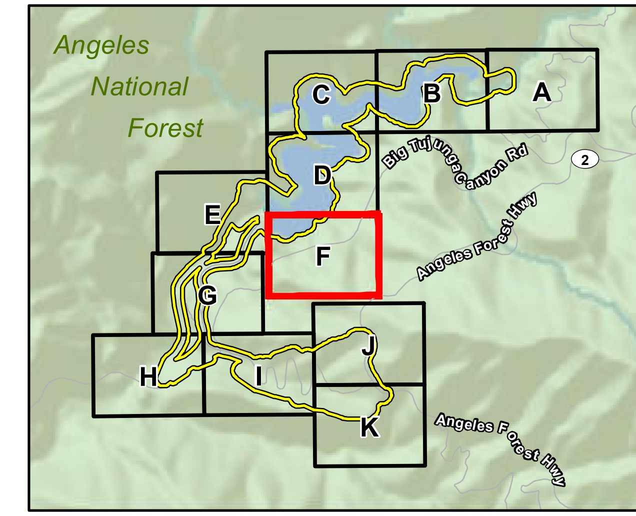
Big Tujunga Reservoir Sediment Removal Project

N W E S

200 100 0 200
Feet

BonTerra CONSULTING

(Rev: 10-12-2011 JCD) R:\PAS\Projects\CoLADPWJ162\Graphics\Bio\Constraints\Plant\Ex4_veg.pdf



Survey Area

Vegetation Types and Other Areas

- Coastal Sage Scrub
- Chamise Chaparral
- Scrub Oak Chapparal
- Mixed Chaparral
- California Annual Grassland
- Disturbed Freshwater Seep
- Riparian Herb
- Willow Riparian Forest
- Willow Riparian Scrub
- White Alder - Fremont Cottonwood - Willow Riparian Forest
- Coast Live Oak Stands
- Bigcone Douglas Fir - Canyon Live Oak Woodland (Forest)
- Open Water
- Streambed
- Cliff
- Ornamental
- Developed

D:\Projects\CoLADPWJ162\MXD\ex_veg.mxd

Vegetation Types and Other Areas

Exhibit 4F

Big Tujunga Reservoir Sediment Removal Project

N W E S

200 100 0 200 Feet

BonTerra CONSULTING

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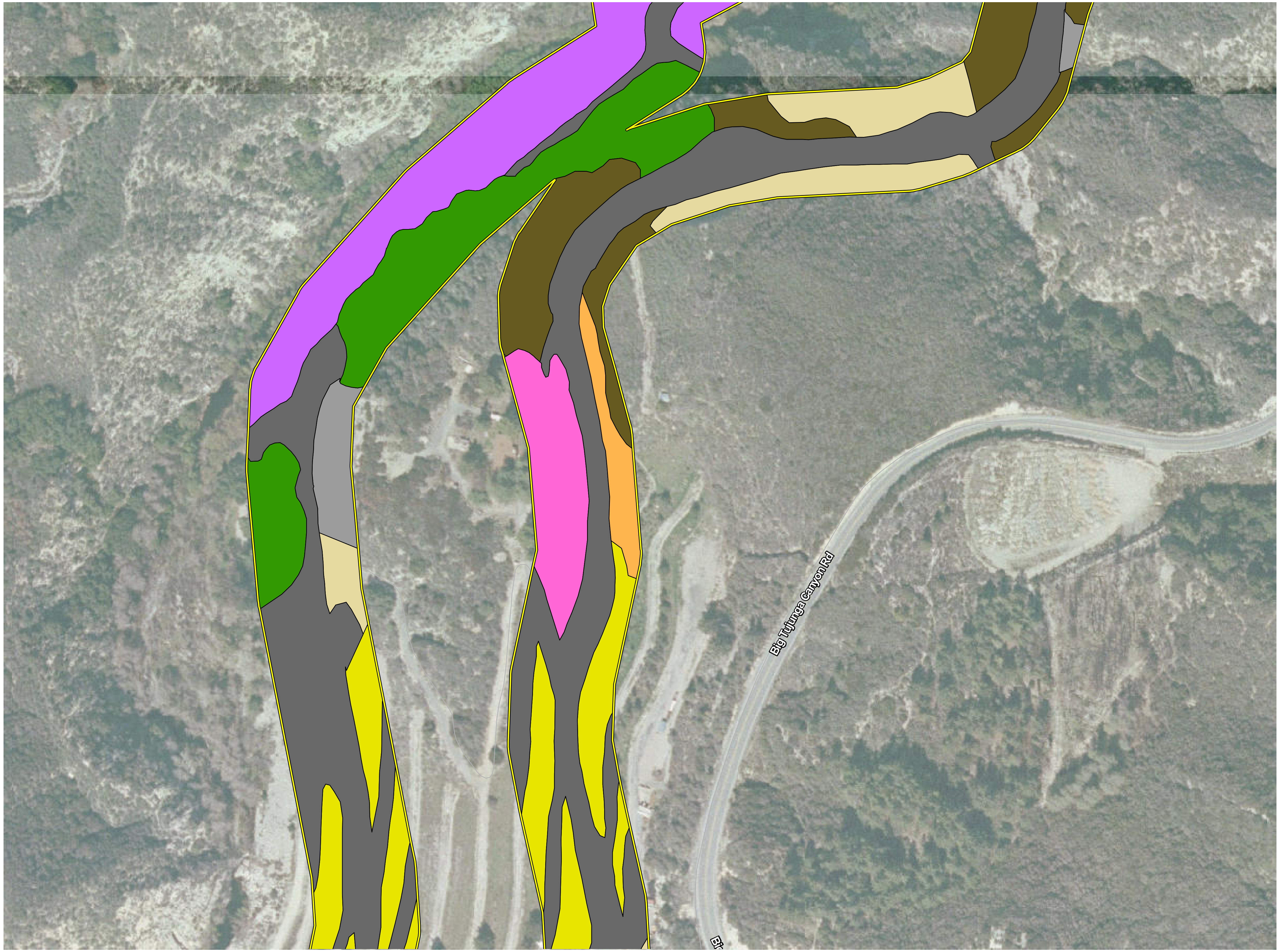

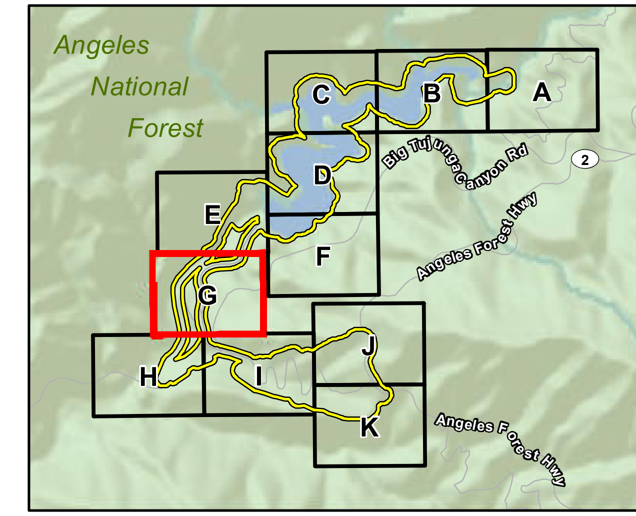

Survey Area

Vegetation Types and Other Areas

- Coastal Sage Scrub
- Chamise Chaparral
- Scrub Oak Chapparal
- Mixed Chaparral
- California Annual Grassland
- Disturbed Freshwater Seep
- Riparian Herb
- Willow Riparian Forest
- Willow Riparian Scrub
- White Alder - Fremont Cottonwood - Willow Riparian Forest
- Coast Live Oak Stands
- Bigcone Douglas Fir - Canyon Live Oak Woodland (Forest)
- Open Water
- Streambed
- Cliff
- Ornamental
- Developed

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Vegetation Types and Other Areas

Exhibit 4G

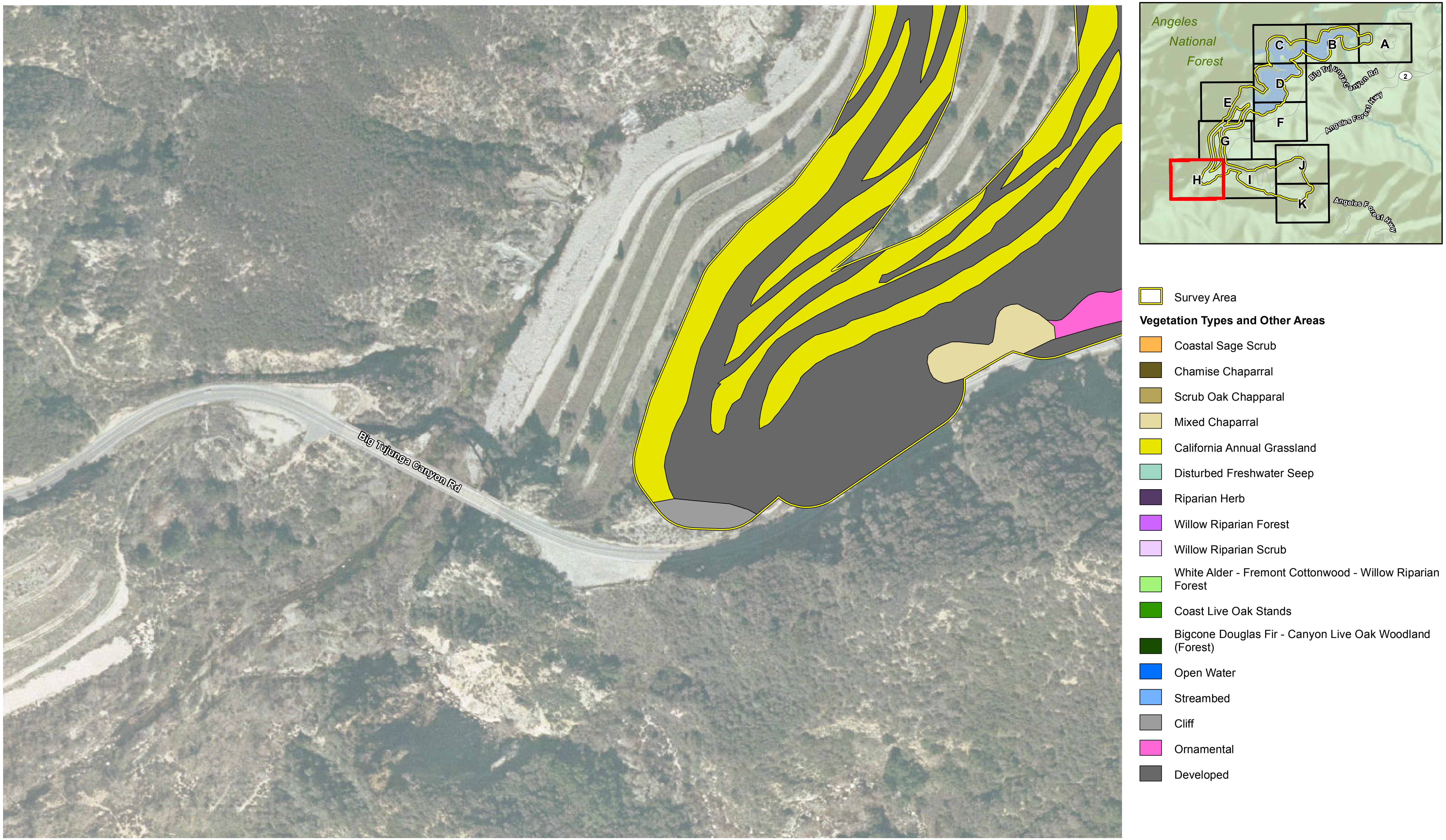
Big Tujunga Reservoir Sediment Removal Project

N W E S

200 100 0 200 Feet

BonTerra CONSULTING

(Rev: 10-12-2011 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Constraints\Plant\Ex4_veg.pdf



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Vegetation Types and Other Areas

Exhibit 4H

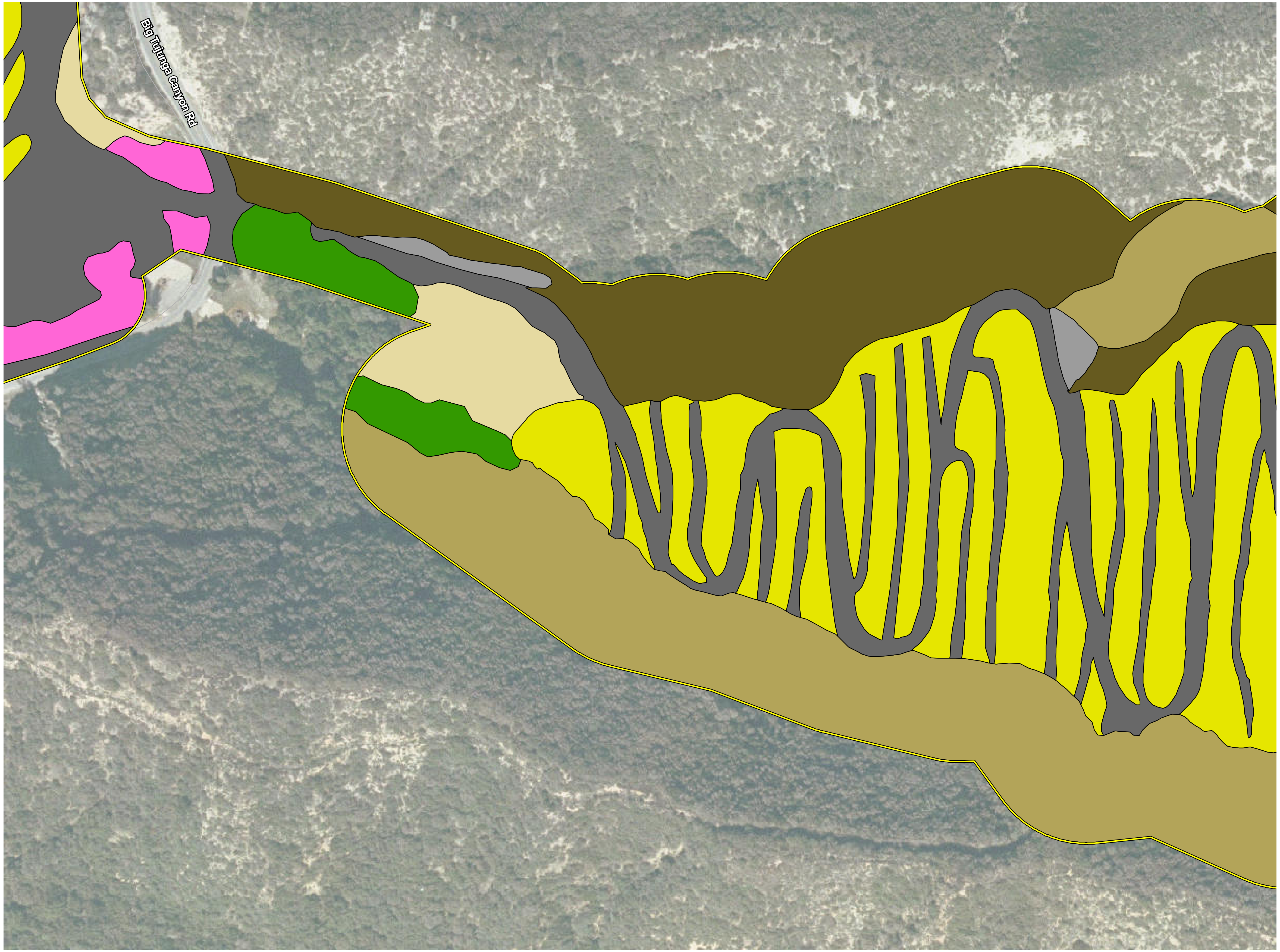
Big Tujunga Reservoir Sediment Removal Project

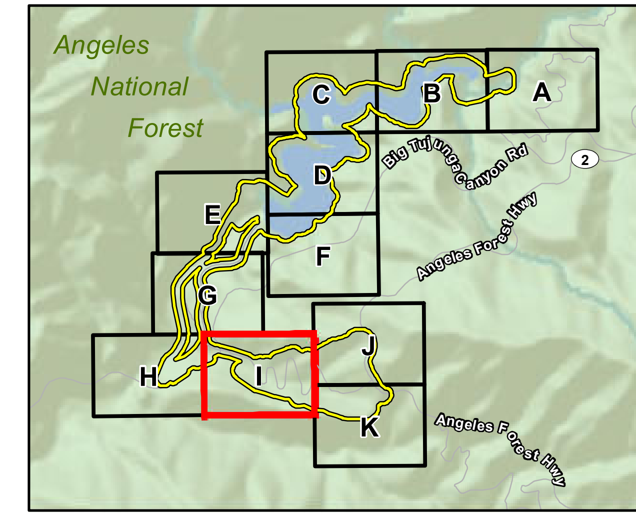
N W E S

200 100 0 200
Feet

BonTerra CONSULTING

(Rev: 10-12-2011 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Constraints\Plant\Ex4_veg.pdf





Survey Area

Vegetation Types and Other Areas

- Coastal Sage Scrub
- Chamise Chaparral
- Scrub Oak Chapparal
- Mixed Chaparral
- California Annual Grassland
- Disturbed Freshwater Seep
- Riparian Herb
- Willow Riparian Forest
- Willow Riparian Scrub
- White Alder - Fremont Cottonwood - Willow Riparian Forest
- Coast Live Oak Stands
- Bigcone Douglas Fir - Canyon Live Oak Woodland (Forest)
- Open Water
- Streambed
- Cliff
- Ornamental
- Developed

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Vegetation Types and Other Areas

Exhibit 4I

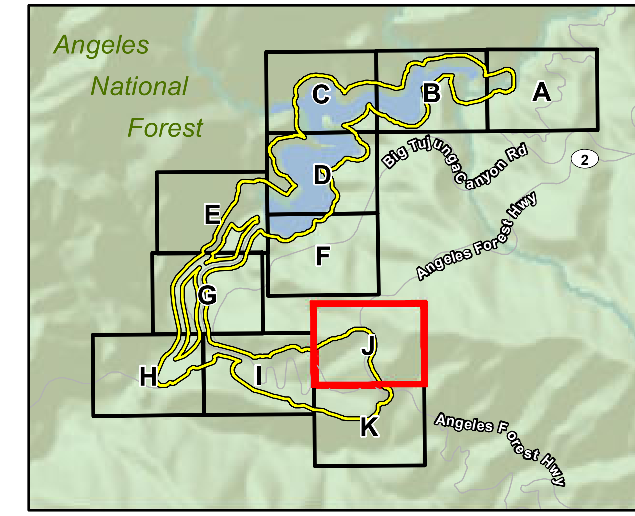
Big Tujunga Reservoir Sediment Removal Project

N W E S

200 100 0 200
Feet

BonTerra CONSULTING

(Rev: 10-12-2011 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Constraints\Plant\Ex4_veg.pdf



Survey Area

Vegetation Types and Other Areas

- Coastal Sage Scrub
- Chamise Chaparral
- Scrub Oak Chapparal
- Mixed Chaparral
- California Annual Grassland
- Disturbed Freshwater Seep
- Riparian Herb
- Willow Riparian Forest
- Willow Riparian Scrub
- White Alder - Fremont Cottonwood - Willow Riparian Forest
- Coast Live Oak Stands
- Bigcone Douglas Fir - Canyon Live Oak Woodland (Forest)
- Open Water
- Streambed
- Cliff
- Ornamental
- Developed

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Vegetation Types and Other Areas

Exhibit 4J

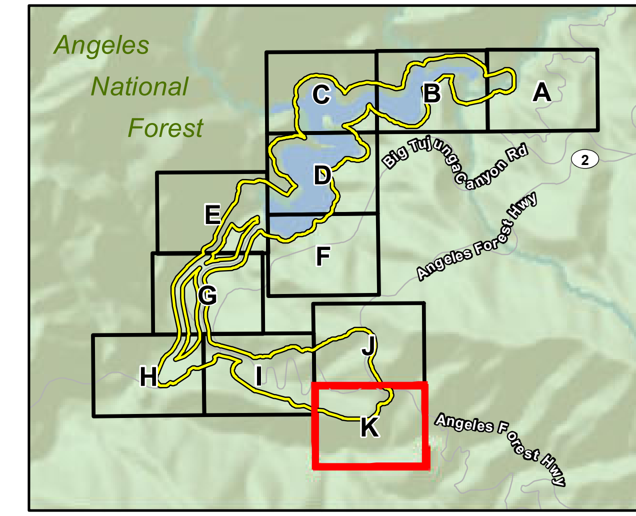
Big Tujunga Reservoir Sediment Removal Project

N W E S

200 100 0 200
Feet

BonTerra CONSULTING

(Rev: 10-12-2011 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Constraints\Plant\Ex4_veg.pdf



Survey Area

Vegetation Types and Other Areas

- Coastal Sage Scrub
- Chamise Chaparral
- Scrub Oak Chapparal
- Mixed Chaparral
- California Annual Grassland
- Disturbed Freshwater Seep
- Riparian Herb
- Willow Riparian Forest
- Willow Riparian Scrub
- White Alder - Fremont Cottonwood - Willow Riparian Forest
- Coast Live Oak Stands
- Bigcone Douglas Fir - Canyon Live Oak Woodland (Forest)
- Open Water
- Streambed
- Cliff
- Ornamental
- Developed

D:\Projects\CoLADPW\J162\MXD\ex_veg.mxd

Vegetation Types and Other Areas

Exhibit 4K

Big Tujunga Reservoir Sediment Removal Project

N W E S

200 100 0 200 Feet

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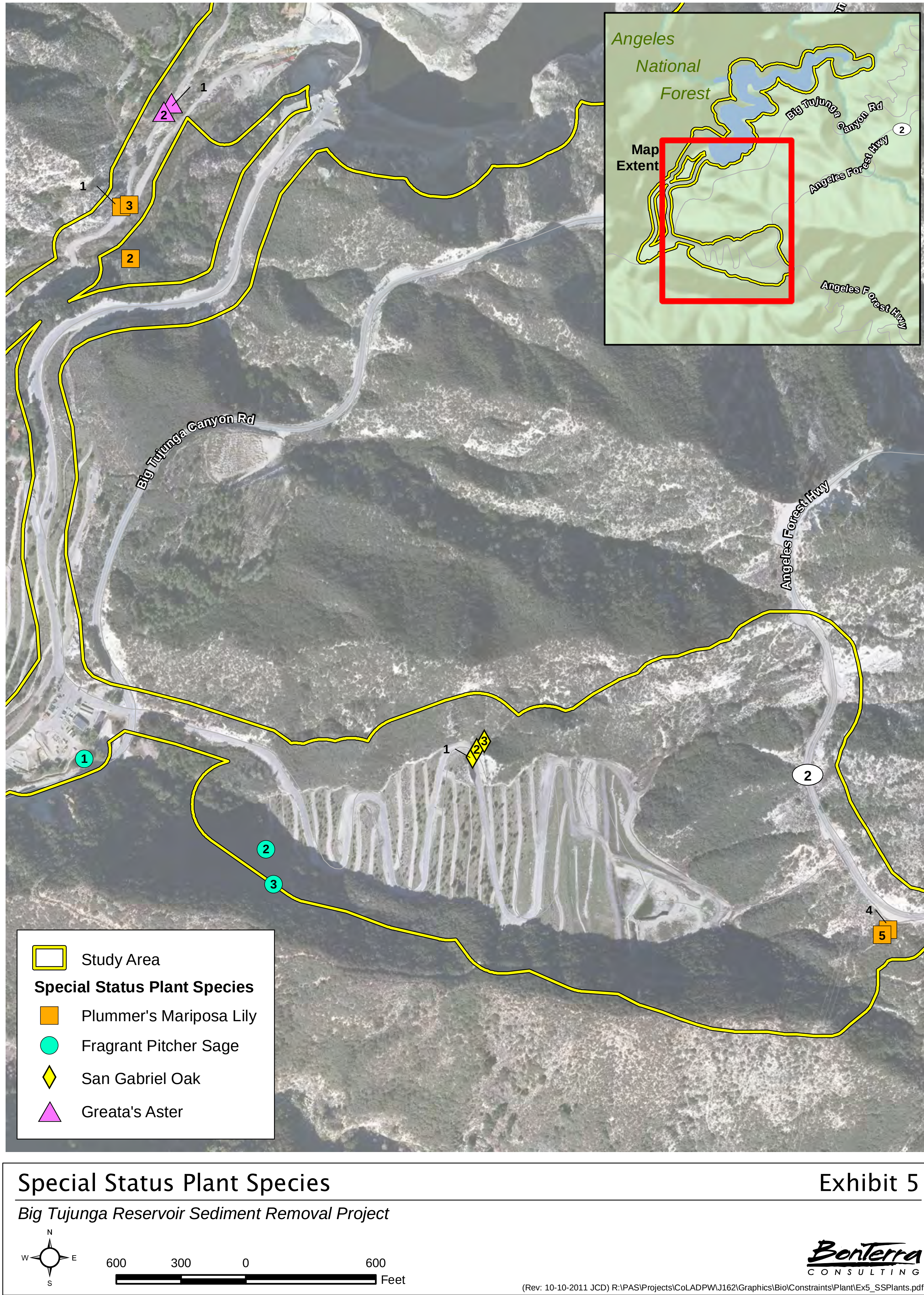
(Rev: 10-12-2011 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Constraints\Plant\Ex4_veg.pdf



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Special Status Plant Species

Exhibit 5

Big Tujunga Reservoir Sediment Removal Project

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(Rev: 10-10-2011 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Constraints\Plant\Ex5_SSPlants.pdf

APPENDIX A

PLANT COMPENDIUM

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED SURVEY

Species	
***PTERIDOPHYTES* – FERNS AND ALLIES**	
***Blechnaceae* – Deer Fern Family**	
Woodwardia fimbriata	giant chain fern
***Dryopteridaceae* – Wood Fern Family**	
Dryopteris arguta	coastal wood fern
***Polypodiaceae* – Polypody Family**	
Polypodium californicum	California polypody
***Pteridaceae* – Brake Family**	
Adiantum jordanii	California maidenhair
Notholaena californica	California cloak-fern
Pellaea andromedifolia	coffee fern
Pellaea mucronata	bird’s foot fern
Pellaea mucronata var. *mucronata*	bird’s-foot fern
Pentagramma triangularis ssp. *triangularis*	goldenback fern
***Selaginellaceae* – Spike-Moss Family**	
Selaginella bigelovii	Bigelow’s or bushy spike-moss
GYMNOSPERMS	
***Pinaceae* – Pine Family**	
Pinus coulteri	coulter pine
Pinus canariensis	Canary Island pine
Pinus halepensis	Aleppo pine
Pseudotsuga macrocarpa	bigcone douglas-fir
***ANGIOSPERMAE* – FLOWERING PLANTS**	
DICOTYLEDONES	
***Adoxaceae* – Muskroot Family**	
Sambucus nigra ssp. *caerulea*	blue elderberry
***Amaranthaceae* – Amaranth Family**	
*Amaranthus albus**	tumbleweed
***Anacardiaceae* – Sumac Family**	
Malosma laurina	laurel sumac
Rhus integrifolia	lemonade berry
Rhus ovata	sugar bush
Rhus aromatica [*Rhus trilobata*]	skunkbush
Toxicodendron diversilobum	western poison oak
***Apocynaceae* – Dogbane Family**	
*Nerium oleander**	common oleander
***Asteraceae* – Sunflower Family**	
*Ageratina adenophora**	crofton weed
Agoseris retrorsa	spear-leaved agoseris
Ambrosia acanthicarpa	annual bur-sage
Ambrosia psilostachya	western ragweed
Artemisia douglasiana	mugwort
Artemisia dracunculus	tarragon

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED SURVEYS (Continued)

Species	
Baccharis salicifolia ssp. *salicifolia* [*Baccharis salicifolia*]	mule fat
*Bidens pilosa**	common beggar-ticks
Brickellia californica	California brickellbush
Brickellia nevinii	Nevin's brickellia
*Centaurea melitensis**	tocalote/Maltese star thistle
Chaenactis artemisiifolia	white pincushion
Chaenactis glabriuscula	yellow pincushion
Cirsium occidentale	cobweb thistle
Erigeron bonariensis [*Conyza bonariensis*]*	flax-leaved horseweed
Erigeron canadensis [*Conyza canadensis*]	common horseweed
Corethrogyne filaginifolia [*Lessingia filaginifolia*]	California-aster
Eclipta prostrata	false daisy
Ericameria parishii var. *parishii*	Parish's goldenbush
Erigeron foliosus	leafy flebane
Eriophyllum confertiflorum	golden-yarrow
Gutierrezia californica	California matchweed
Hazardia squarrosa	saw-toothed goldenbush
Helianthus annuus	western sunflower
Heterotheca grandiflora	telegraph weed
Heterotheca sessiliflora	sessileflower goldenaster
Heterotheca sessiliflora ssp. *fastigiata*	fastigiate golden aster
*Hypochaeris glabra**	smooth cat's-ear
*Lactuca serriola**	prickly lettuce
Lasthenia californica	California goldfields
Lepidospartum squamatum	scale-broom
Logfia filaginoides [*Filago californica*]	California cottonrose
Malacothrix saxatilis var. *tenuifolia*	slender-leaved malacothrix
Matricaria discoidea [*Chamomilla suaveolens*]*	pineapple weed
Pseudognaphalium californicum [*Gnaphalium californicum*]	California everlasting
Pseudognaphalium canescens [*Gnaphalium canescens*]	Wright's cudweed
Pseudognaphalium luteoalbum [*Gnaphalium luteoalbum*]*	weedy cudweed
Rafinesquia californica	California chicory
Senecio flaccidus var. *douglasii*	Douglas' threadleaf ragwort
*Senecio vulgaris**	common groundsel
Solidago velutina ssp. *californica* [*Solidago californica*]	California goldenrod
Sonchus asper ssp. *asper**	prickly sow thistle
*Sonchus oleraceus**	common sow thistle
Stephanomeria virgata ssp. *virgata*	tall wreath plant
Symphyotrichum greatea	Greata's aster
Uropappus lindleyi	silver puffs
Xanthium strumarium	cocklebur

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED SURVEYS (Continued)

Species	
***Betulaceae* – Birch Family**	
Alnus rhombifolia	white alder
***Boraginaceae* – Borage Family**	
Cryptantha intermedia	common cryptantha
Cryptantha microstachys	Tejon cryptantha
Cryptantha muricata	prickly cryptantha
Emmenanthe penduliflora	whispering bells
Eriodictyon crassifolium	thick-leaved yerba santa
Eriodictyon parryi [*Turricula parryi*]	poodle-dog bush
Eucrypta chrysanthemifolia	common eucrypta
Nemophila menziesii var. *menziesii*	baby blue-eyes
Phacelia brachyloba	short-lobed phacelia
Phacelia cicutaria	caterpillar phacelia
Phacelia minor	wild canterbury-bell
Phacelia ramosissima	branching phacelia
***Brassicaceae* – Mustard Family**	
Arabis sparsiflora	rock cress
Caulanthus heterophyllus	San Diego jewel flower
*Hirschfeldia incana**	shortpod mustard
Nasturtium officinale [*Rorippa nasturtium-aquaticum*]*	water cress
*Sisymbrium orientale**	hare’s ear cabbage
Thysanocarpus curvipes	hairy lacepod
***Campanulaceae* – Bellflower Family**	
Lobelia dunnii var. *serrata*	rothrock lobelia
***Caprifoliaceae* – Honeysuckle Family**	
Lonicera subspicata var. *denudata*	southern honeysuckle
***Chenopodiaceae* – Goosefoot Family**	
*Chenopodium album**	lamb’s quarters
Chenopodium berlandieri	pitseed goosefoot
Dysphania ambrosioides [*Chenopodium ambrosioides*] *	Mexican tea
Dysphania botrys [*Chenopodium botrys*] *	Jerusalum oak
Dysphania pumilio [*Chenopodium pumilio*] *	Tasmanian goosefoot
*Salsola tragus**	Russian thistle
***Cistaceae* – Rock-Rose Family**	
Helianthemum scoparium	peak rush-rose
***Crassulaceae* – Stonecrop Family**	
Crassula connata	pygmy-weed
Dudleya cymosa ssp. *pumila*	canyon liveforever
Dudleya lanceolata	lance-leaved dudleya
***Cucurbitaceae* – Gourd Family**	
Marah macrocarpus	chilicothe

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED SURVEYS (Continued)

Species	
***Ericaceae* – Heath Family**	
Arctostaphylos glauca	bigberry manzanita
***Euphorbiaceae* – Spurge Family**	
*Chamaesyce maculata**	spotted spurge
*Ricinus communis**	castor bean
***Fabaceae* – Legume Family**	
Acmispon glaber [*Lotus scoparius* var. *scoparius*]	deerweed
*Gleditsia triacanthos**	honey locust
Lathyrus vestitus ssp. *vestitus*	chaparral sweet pea
*Lotus unifoliolatus**	Spanish lotus
Lupinus hirsutissimus	stinging lupine
Lupinus truncatus	truncate lupine/collar lupine
*Melilotus alba**	white sweetclover
*Melilotus indica**	sourclover
*Spartium junceum**	Spanish broom
*Trifolium hirtum**	rose clover
*Vicia villosa**	hairy vetch/winter vetch
***Fagaceae* – Oak / Beech Family**	
Quercus agrifolia	coast live oak
Quercus berberidifolia	scrub oak/California scrub oak
Quercus chrysolepis	maul oak/canyon live oak
Quercus durata ssp. *gabrielensis*	San Gabriel Mountains leather oak
***Geraniaceae* – Geranium Family**	
*Erodium botrys**	long-beaked filaree
*Erodium cicutarium**	red-stemmed filaree
***Grossulariaceae* – Gooseberry Family**	
Ribes indecorum	white-flowered currant
***Lamiaceae* – Mint Family**	
Lepechinia fragrans	fragrant pitcher-sage
*Marrubium vulgare**	common horehound
Pycnanthemum californicum	California mountain mint
Salvia apiana	white sage
Salvia columbariae	chia
Salvia mellifera	black sage
***Loasaceae* – Loasa Family**	
Mentzelia affinis	hydra stick-leaf
Mentzelia micrantha	small-flowered stick-leaf
***Lythraceae* – Loosestrife Family**	
*Lythrum hyssopifolia**	grass poly
Montiaceae	
Calyptridium monandrum	common pussypaws
***Myrtaceae* – Myrtle Family**	
*Eucalyptus camaldulensis**	river red gum

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED SURVEYS (Continued)

Species	
***Oleaceae* – Olive Family**	
Fraxinus velutina	velvet ash
***Onagraceae* – Evening Primrose Family**	
Camissonia bistorta	California sun cup
Camissonia californica	false mustard
Camissonia ignota	petioled primrose
Camissonia micrantha	small primrose
Epilobium canum	California fuchsia
***Orobanchaceae* – Broomrape Family**	
Castilleja affinis ssp. *affinis*	coastal/Indian paintbrush
Castilleja foliolosa	woolly indian paintbrush
Orobanche fasciculata	clustered broomrape
***Papaveraceae* – Poppy Family**	
Dendromecon rigida	bush poppy
Ehrendorferia chrysantha [*Dicentra chrysantha*]	golden ear-drops
Eschscholzia caespitosa	tufted poppy
Eschscholzia californica	California poppy
Meconella denticulata	small-flowered meconella
Papaver californicum	fire poppy
***Phrymaceae* – Lopseed Family**	
Mimulus aurantiacus	bush monkeyflower
Mimulus brevipes	slope semaphore
Mimulus cardinalis	scarlet monkeyflower
Mimulus floribundus	showy monkeyflower
Mimulus pilosus	downy monkeyflower
***Plantaginaceae* – Plantain Family**	
Antirrhinum coulterianum	white snapdragon
Antirrhinum multiflorum	perennial snapdragon
Keckiella cordifolia	heart-leaved bush-penstemon
Keckiella ternata ssp. *ternata*	blue-stemmed bush-penstemon
Penstemon spectabilis	royal penstemon
*Plantago major**	common plantain
*Veronica anagallis-aquatica**	water speedwell
***Platanaceae* – Sycamore Family**	
Platanus racemosa	western sycamore
***Polemoniaceae* – Phlox Family**	
Allophyllum glutinosum	blue false-gilia
Saltugilia splendens [*Gilia splendens*]	splendid woodland-gilia
Linanthus californicum [*Leptodactylon californicum*]	prickly phlox
***Polygonaceae* – Buckwheat Family**	
Erigonum fasciculatum var. *polifolium*	Mojave Desert California buckwheat
Eriogonum elongatum var. *elongatum*	long-stemmed wild buckwheat
Eriogonum fasciculatum var. *foliolosum*	leafy California buckwheat
Persicaria lapathifolia [*Polygonum lapathifolium*]	willow weed

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED SURVEYS (Continued)

Species	
*Polygonum argyrocoleon**	Persian knotweed
Pterostegia drymarioides	woodland threadstem
*Rumex conglomeratus**	whorled dock
*Rumex crispus**	curly dock
***Portulacaceae* – Purslane Family**	
Claytonia perfoliata	miner's lettuce
***Ranunculaceae* – Crowfoot Family**	
Clematis lasiantha	chaparral clematis, pipestem clematis
Delphinium cardinale	scarlet larkspur
Delphinium parryi ssp. *parryi*	Parry's larkspur/blue larkspur
***Rhamnaceae* – Buckthorn Family**	
Ceanothus crassifolius	hoaryleaf ceanothus
Frangula californica [*Rhamnus californica*]	California coffee berry
Ceanothus leucodermis	chaparral whitethorn
Ceanothus oliganthus	hairy ceanothus
Rhamnus ilicifolia	hollyleaf redberry
***Rosaceae* – Rose Family**	
Adenostoma fasciculatum var. fasciculatum	chamise
Cercocarpus betuloides var. *betuloides*	birch-leaf mountain-mahogany
Heteromeles arbutifolia	toyon/christmas berry
Prunus ilicifolia	holly-leaved cherry
Rubus ursinus	California blackberry
***Rubiaceae* – Madder Family**	
Galium angustifolium	narrowly leaved bedstraw
Galium aparine	goose grass
***Salicaceae* – Willow Family**	
Populus fremontii ssp. *fremontii*	Fremont cottonwood
Salix gooddingii	Goodding's black willow
Salix laevigata	red willow
Salix lasiolepis	arroyo willow
Salix lasiandra var. *lasiandra* [*Salix lucida* ssp. *lasiandra*]	pacific willow
***Sapindaceae* – Soap Berry Family**	
Acer macrophyllum	big-leaf maple
***Saxifragaceae* – Saxifrage Family**	
Lithophragma affine	woodland star
***Scrophulariaceae* – Figwort Family**	
Scrophularia californica	California figwort
*Verbascum virgatum**	wand mullein
***Solanaceae* – Nightshade Family**	
Datura wrightii	jimson weed
*Nicotiana glauca**	tree tobacco
Solanum douglasii	Douglas' nightshade
Solanum xanti	chaparral nightshade

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED SURVEYS (Continued)

Species	
***Tamaricaceae* – Tamarisk Family**	
*Tamarix ramosissima**	Mediterranean tamarix
***Ulmaceae* – Elm Family**	
*Ulmus parvifolia**	Chinese elm
***Urticaceae* – Nettle Family**	
Urtica dioica ssp. *holosericea*	hoary nettle
***Zygophyllaceae* – Caltrop Family**	
*Tribulus terrestris**	puncture vine
***MONOCOTYLEDONES* – MONOCOTS**	
***Agavaceae* – Century Plant Family**	
Hesperoyucca whipplei [*Yucca whipplei*]	our Lord's candle
***Araceae* – Arum Family**	
Lemna minor	water lentil/lesser duckweed
***Cyperaceae* – Sedge Family**	
Cyperus eragrostis	tall umbrella-sedge
***Iridaceae* – Iris Family**	
Sisyrinchium bellum	western blue-eyed grass
***Juncaceae* – Rush Family**	
Juncus bufonius	toad rush
Juncus macrophyllus	long-leaved rush
Juncus xiphioides	iris-leaved rush
***Liliaceae* – Lily Family**	
Calochortus plummerae	Plummer's mariposa lily
***Orchidaceae* – Orchid Family**	
Epipactis gigantea	stream orchid
***Poaceae* – Grass Family**	
Stipa coronata [*Achnatherum coronatum*]	crested needlegrass
*Agrostis viridis**	water bentgrass
*Avena barbata**	slender wild oat
*Avena fatua**	wild oat
*Bromus diandrus**	ripgut grass
*Bromus hordeaceus**	soft chess
Bromus madritensis ssp. *rubens**	foxtail chess
*Bromus tectorum**	cheat grass
*Cynodon dactylon**	bermuda grass
*Echinochloa colona**	jungle rice
*Echinochloa crus-galli**	barnyard grass
Elymus condensatus [*Leymus condensatus*]	giant wild rye
Elymus glaucus	blue wild-rye
Festuca microstachys [*Vulpia microstachys* var. *pauciflora*]	Pacific fescue
Festuca myuros [*Vulpia myuros* var. *myuros*]*	rattail fescue
Festuca octoflora [*Vulpia octoflora* var. *hirtella*]	hairy six-weeks fescue
Hordeum murinum var. *leporinum**	hare barley
*Lamarckia aurea**	goldentop

PLANTS SPECIES OBSERVED WITHIN THE SURVEY AREA DURING FOCUSED SURVEYS (Continued)

Species	
Leptochloa fusca ssp. *uninervia* [*Leptochloa uninervia*]	Mexican sprangletop
*Lolium perenne**	perennial ryegrass
Muhlenbergia rigens	deergrass
*Piptatherum miliaceum**	smilo grass/millett ricegrass
Poa secunda	one-sided bluegrass/malpais bluegrass
*Polypogon monspeliensis**	annual beard grass
*Schismus barbatus**	Mediterranean schismus
***Themidaceae* – Brodiaea Family**	
Dichelostemma capitatum	blue dicks
***Typhaceae* – Cattail Family**	
Typha domingensis	southern cattail
Typha latifolia	broad-leaved cattail
* non-native species	

APPENDIX B

SPECIAL STATUS PLANT PHOTOGRAPHS

Plummer's mariposa lily (*Calochortus plummerae*) observed during focused surveys.

Fragrant pitcher sage (*Lepechinia fragrans*) observed during focused surveys.

D:\Projects\CoLADPW\J162\Graphics\AppB_1.ai

Special Status Plant Photographs

Appendix B-1

Big Tujunga Reservoir Sediment Removal Project

BonTerra CONSULTING

(Rev: 10-10-11 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Constraints\Plant\AppB_1.pdf

San Gabriel oak (*Quercus durata* var. *gabrielensis*) observed during focused surveys.

Greta's aster (*Symphyotrichum greatae*) observed during focused surveys.

D:\Projects\CoLADPW\J162\Graphics\AppB_2.ai

Special Status Plant Photographs

Appendix B-2

Big Tujunga Reservoir Sediment Removal Project

BonTerra CONSULTING

(Rev: 10-10-11 JCD) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Constraints\Plant\AppB_2.pdf

APPENDIX C

SPECIAL STATUS PLANT POPULATION DETAILS

TABLE C-1
PLUMMER'S MARIPOSA LILY POPULATIONS OBSERVED IN THE SURVEY AREA

Population	Number of Individuals	Percent Phenology			Habitat	Soil	Slope	Aspect	Associated Species
		Vegetative	Flowering	Fruiting					
1	3	—	100	—	rocky cliff face	rocky outcrops	flat above sheer cliff	W	everlasting (*Pseudognaphalium canescens* [*Gnaphalium canescens*]), white sage (*Salvia apiana*), cliff malacothrix (*Malacothrix saxatilis*), deerweed (*Acmispon glaber* [*Lotus scoparius*]), our Lord's candle (*Hesperoyucca whipplei* [*Yucca whipplei*]), slender wild oat (*Avena barbata*), California buckwheat (*Eriogonum fasciculatum*), branching phacelia (*Phacelia ramosissima*), Bigelow's spike-moss (*Selaginella bigelovii*), one-sided bluegrass (*Poa secunda*)
2	1	—	100	—	rocky cliff face	rocky outcrops	flat above sheer cliff	W	everlasting, white sage, cliff malacothrix, deerweed, our Lord's candle, slender wild oat, California buckwheat, branching phacelia, Bigelow's spike-moss, one-sided bluegrass
3	1	—	100	—	rocky cliff face	rocky outcrops	flat above sheer cliff	W	everlasting, white sage, cliff malacothrix, deerweed, our Lord's candle, slender wild oat, California buckwheat, branching phacelia, Bigelow's spike-moss, one-sided bluegrass
4	10	80	20	—	burned chaparral	rocky loamy sand	35%	S	chamise (*Adenostoma fasciculatum*), California buckwheat, thick-leaved yerba santa (*Eriodictyon crassifolium*), our Lord's candle, chia (*Salvia columbariae*), white pincushion (*Chaenactis artemisifolia*)
5	15	80	20	—	burned chaparral	rocky loamy sand	40%	S	chamise, deerweed, hoaryleaf ceanothus (*Ceanothus crassifolius*), thick-leaved yerba santa, our Lord's candle, bush poppy (*Dendromecon rigida*)
Total	**30**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

N/A: not applicable

TABLE C-2
FRAGRANT PITCHER SAGE POPULATIONS OBSERVED IN THE SURVEY AREA

Population	Number of Individuals	Percent Phenology			Habitat	Soil	Slope	Aspect	Associated Species
		Vegetative	Flowering	Fruiting					
1	7	14	86	—	scrub oak chaparral/ coastal sage scrub	rocky loam	10–15%	N, NW	California buckwheat, birch-leaf mountain-mahogany (*Cercocarpus betuloides* var. *betulodies*), deerweed, hoaryleaf ceanothus, narrowly leaved bedstraw (*Galium angustifolium*), heart-leaved bush-penstemon (*Keckiella cordifolia*), bush monkeyflower (*Mimulus aurantiacus*)
2	4	75	25	—	mixed – scrub oak chaparral	rocky loam	10–20%	N	cliff malacothrix, golden-yarrow (*Eriophyllum confertiflorum*), heart-leaved bush-penstemon, toyon (*Heteromeles arbutifolia*), bush monkeyflower, little California melic grass (*Melica imperfecta*)
3	3	—	100	—	mixed – scrub oak chaparral	rocky loam	10–20%	N	cliff malacothrix, golden-yarrow, heart-leaved bush-penstemon, deerweed, our Lord's candle, slender wild oat
Total	**14**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

N/A: not applicable

TABLE C-3
SAN GABRIEL OAK POPULATIONS OBSERVED IN THE SURVEY AREA

Population	Number of Individuals	Percent Phenology			Habitat	Soil	Slope	Aspect	Associated Species
		Vegetative	Flowering	Fruiting					
1	5	40	30	30	mixed chaparral	rocky sandy loam	15%	W	holly-leaved cherry (*Prunus ilicifolia*), California buckwheat, long-stemmed wild buckwheat (*Eriogonum elongatum*), bush poppy, our Lord's candle, bush monkeyflower
2	3	100	—	—	chamise chaparral	rock	45%	N	chamise, California buckwheat, bush monkeyflower, our Lord's candle, threadleaf ragwort (*Senecio flaccidus*)
3	40	80	—	20	burned mixed chaparral	rocky sandy loam	45%	N	toyon, hollyleaf redberry (*Rhamnus ilicifolia*), our Lord's candle, bush poppy, coastal wood fern (*Dryopteris arguta*), cliff malacothrix, common miner's-lettuce (*Claytonia perfoliata*), hairy lilac (*Ceanothus oliganthus*), chilicothe (*Marah macrocarpus*), California everlasting (*Pseudognaphalium californicum* [*Gnaphalium californicum*])
Total	**48**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

N/A: not applicable

TABLE C-4
GREATA'S ASTER POPULATIONS OBSERVED IN THE SURVEY AREA

Population	Number of Individuals	Percent Phenology			Habitat	Soil	Slope	Aspect	Associated Species
		Vegetative	Flowering	Fruiting					
1	1	—	100	—	freshwater seep	rock (cliff face)	150%	E	crofton weed (*Ageratina adenophora*), bentgrass (*Agrostis* sp.), stream orchid (*Epipactis gigantea*), scarlet monkeyflower (*Mimulus cardinalis*), western blue-eyed grass (*Sisyrinchium bellum*), California maidenhair (*Adiantum jordanii*), smilo grass (*Piptatherum miliaceum*)
2	4	25	75	—	freshwater seep	rock (cliff face)	150%	E	crofton weed, California fuchsia (*Epilobium canum*), western blue-eyed grass, stream orchid, smilo grass, Fremont cottonwood (*Populus fremontii*), scarlet monkeyflower
Total	**5**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**

N/A: not applicable

APPENDIX D

CALIFORNIA NATURAL DIVERSITY DATABASE FORMS

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 06/16/2011

For Office Use Only

Source Code ______ Quad Code ______
Elm Code ______ Occ. No. ______
EO Index No. ______ Map Index No. ______

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Calochortus plummerae*

Common Name: Plummer's mariposa lily

Species Found? ☑ Yes ☐ No ______ If not, why?

Total No. Individuals 25 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? ______ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: David Bramlet
Address: 1691 Mesa Drive, No. A-2
Newport Beach, CA 92660
E-mail Address: debramlet@earthlink.net
Phone: (714) 549-0647

Plant Information

Phenology: 80 % vegetative 20 % flowering 0 % fruiting

Animal Information

____ # adults ____ # juveniles ____ # larvae ____ # egg masses ____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

In Maple Canyon near Big Tujunga Dam.

County: Los Angeles Landowner / Mgr.: Angeles National Forest

Quad Name: Condor Peak Elevation: 3158 ft

T 2N R 12W Sec 6, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☑ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin 60CSX

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy 10-20 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: Population 1: 0391454mE, 3794102mN; Population 2: 0391446mE, 3794095mN

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Population 1 has 10 individuals and population 2 has 15 individuals. Plants in burned chaparral on rocky loamy sand substrate with 35% slope and southern aspect. Population 1 associated species are chamise (Adenostoma fasciculatum), California buckwheat (Eriogonum fasciculatum), thick-leaf yerba santa (Eriodictyon crassifolium), our Lord's candle (Hesperoyucca whipplei [Yucca whipplei]), chia (Salvia columbariae), and white pincushion (Chaenactis artemisifolia). Population 2 associated species are chamise, deerweed (Acmispon glaber [Lotus scoparius]), hoaryleaf ceanothus (Ceanothus crassifolius), thick-leaf yerba santa, our Lord's candle, and bush poppy (Dendromecon rigida).

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: Big Tujunga Dam sediment placement site and access road; open space

Visible disturbances: access road, sediment placement

Threats: sediment removal and transport from above Big Tujunga Dam to the Maple Canyon sediment placement site

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☐ Keyed (cite reference):
- ☐ Compared with specimen housed at:
- ☐ Compared with photo / drawing in:
- ☐ By another person (name):
- ☑ Other: familiarity with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

For Office Use Only

Source Code ______ Quad Code ______
Elm Code ______ Occ. No. ______
EO Index No. ______ Map Index No. ______

Date of Field Work (mm/dd/yyyy): 06/13/2011

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: Calochortus plummerae

Common Name: Plummer's mariposa lily

Species Found? ☑ Yes ☐ No ______ If not, why?

Total No. Individuals 5 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? ______ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: David Bramlet
Address: 1691 Mesa Drive, No. A-2
Newport Beach, CA 92660
E-mail Address: debramlet@earthlink.net
Phone: (714) 549-0647

Plant Information

Phenology: ___% vegetative 100 % flowering ___% fruiting

Animal Information

___ # adults ___ # juveniles ___ # larvae ___ # egg masses ___ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

In Big Tujunga Canyon downstream of Big Tujunga Dam.

County: Los Angeles Landowner / Mgr.: Angeles National Forest

Quad Name: Condor Peak Elevation: 2,200 feet

T 2N R 13W Sec 1, ___ ¼ of ___ ¼, Meridian: H☐ M☐ S☑ Source of Coordinates (GPS, topo. map & type): GPS

T___ R___ Sec ___, ___ ¼ of ___ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin 60CSX

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy 10-20 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ **OR** Geographic (Latitude & Longitude) ☐

Coordinates: Population 1: 0390384mE, 3795131mN; Population 2: 0390396mE, 3795058mN; Population 3: 0390395mE, 3795134mN

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Population 1 has 3 individuals and populations 2 and 3 each have 1 individual. Plants on flat area above rocky cliff face with western aspect. Associated species are everlasting (Pseudognaphalium canescens [Gnaphalium canescens]), white sage (Salvia apiana), cliff malacothrix (Malacothrix saxatilis), deerweed (Acmispon glaber [Lotus scoparius]), our Lord's candle (Hesperoyucca whipplei [Yucca whipplei]), slender wild oat (Avena barbata), California buckwheat (Eriogonum fasciculatum), branching phacelia (Phacelia ramosissima), Bigelow's spike-moss (Selaginella bigelovii), and one-sided bluegrass (Poa secunda).

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: Big Tujunga Dam and access road; open space

Visible disturbances: adjacent access road to Big Tujunga Dam

Threats: sediment removal above Big Tujunga Dam and transport to Maple Canyon

Comments:

Determination: *(check one or more, and fill in blanks)*

☐ Keyed (cite reference): ______
☐ Compared with specimen housed at: ______
☐ Compared with photo / drawing in: ______
☐ By another person (name): ______
☑ Other: familiarity with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 06/13/2011

For Office Use Only

Source Code ____ Quad Code ____
Elm Code ____ Occ. No. ____
EO Index No. ____ Map Index No. ____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Lepechinia fragrans*

Common Name: fragrant pitcher sage

Species Found? ☑ Yes ☐ No ____ If not, why?

Total No. Individuals 14 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? ____ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: ____ Number ____ Museum / Herbarium

Reporter: David Bramlet

Address: 1691 Mesa Drive, No. A-2
Newport Beach, CA 92660

E-mail Address: debramlet@earthlink.net

Phone: (714) 549-0647

Plant Information

Phenology: 29 % vegetative 71 % flowering 0 % fruiting

Animal Information

____ # adults ____ # juveniles ____ # larvae ____ # egg masses ____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

Maple Canyon near Big Tujunga Dam

County: Los Angeles Landowner / Mgr.: Angeles National Forest

Quad Name: Condor Peak Elevation: 2,420

T 2N R 13W Sec 1, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☑ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin 60CSX

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy 10-20 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ **OR** Geographic (Latitude & Longitude) ☐

Coordinates: Population 1: 0390324mE, 3794354mN; Population 2: 0390579mN, 3794224mN; Population 3: 0390589mE, 3794175mN

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Population 1 (1 individual) in scrub oak chaparral/coastal sage scrub, rocky loam substrate, 10-15% slope, N/NW aspect. Population 2 (4 individuals) and Population 3 (3 individuals) in mixed scrub oak chaparral, rocky loam substrate, 10-20% slope, N aspect. Associated species: California buckwheat (Eriogonum fasciculatum), birch-leaf mountain-mahogany (Cercocarpus betuloides var. betuloides), deerweed (Acmispon glaber), hoaryleaf ceanothus (Ceanothus crassifolius), narrowly leaved bedstraw (Galium angustifolium), heart-leaved bush-penstemon (Keckiella cordifolia), bush monkeyflower (Mimulus aurantiacus), cliff malacothrix (Malacothrix saxatilis), golden-yarrow (Eriophyllum confertiflorum), toyon (Heteromeles arbutifolia), little California melic grass (Melic imperfecta)

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: Big Tujunga Dam sediment placement site and access road; open space

Visible disturbances: access road, sediment placement

Threats: sediment removal and transport from above Big Tujunga Dam to the Maple Canyon sediment placement site

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☐ Keyed (cite reference): ____
- ☐ Compared with specimen housed at: ____
- ☐ Compared with photo / drawing in: ____
- ☐ By another person (name): ____
- ☑ Other: familiarity with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 06/16/2011

For Office Use Only

Source Code ________ Quad Code ________
Elm Code ________ Occ. No. ________
EO Index No. ________ Map Index No. ________

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Quercus durata var. gabrielensis*

Common Name: San Gabriel oak

Species Found? ☑ Yes ☐ No ________ If not, why?

Total No. Individuals 49 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? ________ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: ________ Number ________ Museum / Herbarium

Reporter: David Bramlet
Address: 1691 Mesa Drive, No. A-2
Newport Beach, CA 92660
E-mail Address: debramlet@earthlink.net
Phone: (714) 549-0647

Plant Information

Phenology: 75 % vegetative 3 % flowering 22 % fruiting

Animal Information

____ # adults ____ # juveniles ____ # larvae ____ # egg masses ____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

In Maple Canyon near Big Tujunga Dam.

County: Los Angeles Landowner / Mgr.: Angeles National Forest

Quad Name: Condor Peak Elevation: 2,880 feet

T 2N R 13W Sec 1 , ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☑ Source of Coordinates (GPS, topo. map & type): GPS

T ____ R ____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin 60CSX

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy 10-20 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: Population 1: 390871mE, 3794351mN; Population 2: 390877nE, 3794361mN; Population 3: 390888mE, 3794373mN; Population 4: 390888mE, 3794373mN

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Population 1 (5 individuals) in mixed chaparral, rocky sandy loam substrate, 15% slope, W aspect. Population 2 (3 individuals) in chamise chaparral, rocky substrate, 45% slope, N aspect. Population 3 (1 individual) in mixed chaparral, rocky loamy sand substrate, 20% slope, S aspect. Population 4 (40 individuals) in burned mixed chaparral, rocky sandy loam, 45% slope, N aspect. Associated species: Prunus ilicifolia, Eriogonum fasciculatum, Eriogonum elongatum, Dendromecon rigida, Hesperoyucca whipplei (Yucca whipplei), Mimulus aurantiacus, Adenostoma fasciculatum, Senecio flaccidus, Salvia mellifera, Ceanothus crassifolius, Heteromeles arbutifolia, Rhamnus ilicifolia, Dryopteris arguta, Malacothrix saxatilis, Claytonia perfoliata, Ceanothus oliganthus, Marah macrocarpus

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: Big Tujunga Dam sediment placement site and access road; open space

Visible disturbances: access road, sediment placement

Threats: sediment removal and transport from above Big Tujunga Dam to the Maple Canyon sediment placement site

Comments:

Determination: *(check one or more, and fill in blanks)*

☐ Keyed (cite reference): ________
☐ Compared with specimen housed at: ________
☐ Compared with photo / drawing in: ________
☐ By another person (name): ________
☑ Other: familiarity with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 08/26/2011

For Office Use Only

Source Code ____ Quad Code ____
Elm Code ____ Occ. No. ____
EO Index No. ____ Map Index No. ____

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Symphyotrichum greatae*

Common Name: Greata's aster

Species Found? ☑ Yes ☐ No ____ If not, why?

Total No. Individuals 5 Subsequent Visit? ☐ yes ☑ no

Is this an existing NDDB occurrence? ____ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: ____ Number ____ Museum / Herbarium

Reporter: David Bramlet
Address: 1691 Mesa Drive, No. A-2
Newport Beach, CA 92660
E-mail Address: debramlet@earthlink.net
Phone: (714) 549-0647

Plant Information

Phenology: 20 % vegetative 80 % flowering 0 % fruiting

Animal Information

____ # adults ____ # juveniles ____ # larvae ____ # egg masses ____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description (please attach map AND/OR fill out your choice of coordinates, below)

In Big Tujunga Canyon immediately downstream of Big Tujunga Dam.

County: Los Angeles Landowner / Mgr.: Angeles National Forest

Quad Name: Condor Peak Elevation: 2,200 ft

T 2N R 13W Sec 1, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☑ Source of Coordinates (GPS, topo. map & type): GPS

T ____ R ____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin 60CSX

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy 10-20 feet meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: Population 1: 0390456mE, 3795277mN; Population 2: 0390445mE, 3795265nM

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Population 1 has 1 individual and Population 2 has 4 individuals. Individuals located on rock substrate (cliff face) of freshwater seep. Slope is 150% and aspect is east. Population 1 associated species are crofton weed (Ageratina adenophora), bentgrass (Agrostis sp.), stream orchid (Epipactis gigantea), scarlet monkeyflower (Mimulus cardinalis), western blue-eyed grass (Sisyrinchium bellum), California maidenhair (Adiantum jordanii), and smilo grass (Piptatherum miliaceum). Population 2 associated species are crofton weed, California fuchsia (Epilobium canum), western blue-eyed grass, stream orchid, smilo grass, Fremont cottonwood (Populus fremontii), and scarlet monkeyflower.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☐ Good ☑ Fair ☐ Poor

Immediate AND surrounding land use: Big Tujunga Dam and access road; open space

Visible disturbances: adjacent access road to Big Tujunga Dam

Threats: sediment removal and transport from above Big Tujunga Dam to the Maple Canyon sediment placement site

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☐ Keyed (cite reference): ____
- ☐ Compared with specimen housed at: ____
- ☐ Compared with photo / drawing in: ____
- ☐ By another person (name): ____
- ☑ Other: familiarity with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☑
Habitat	☐	☐	☑
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☑ no ☐

APPENDIX B-8

LEAST BELL'S VIREO AND SOUTHWESTERN WILLOW FLYCATCHER LETTER REPORT

October 3, 2012

Ms. Susie Tharratt
Recovery Permit Coordinator
Carlsbad Fish and Wildlife Office
6010 Hidden Valley Road, Suite 101
Carlsbad, California 92011

VIA EMAIL AND MAIL
Susie_Tharratt@fws.gov

Subject: Results of Focused Presence/Absence Least Bell's Vireo and Southwestern Willow Flycatcher Surveys for the Big Tujunga Dam and Reservoir Sediment Removal Project, Los Angeles County, California

Dear Ms. Tharratt:

This Letter Report presents the results of focused surveys to determine the presence or absence of the least Bell's vireo (*Vireo bellii pusillus*) and southwestern willow flycatcher (*Empidonax traillii extimus*) on the Big Tujunga Dam and Reservoir Sediment Removal Project, located in Los Angeles County, California. A Biologist with the necessary experience and the Federal Endangered Species Act 10(a) survey permit conducted the surveys according to U.S. Fish and Wildlife Service (USFWS) protocol for these species.

<u>Project Location and Description</u>

Big Tujunga Canyon is located on the southern edge of the San Gabriel Mountains, within the Angeles National Forest, and is located on the U.S. Geological Survey (USGS) Condor Peak 7.5-minute topographic quadrangle (Exhibit 1). The survey area for the southwestern willow flycatcher and least Bell's vireo surveys included Big Tujunga Creek extending approximately 2 river miles upstream of Big Tujunga Reservoir, and Big Tujunga Wash from Big Tujunga Dam to approximately 1.5 river miles downstream of the dam (Exhibit 2). Because of the length of the two sections of stream to be surveyed, the upper and lower sections were surveyed on separate days. The upper section survey area includes Big Tujunga Creek upstream of Big Tujunga Reservoir to approximately Fall Creek Campground. The lower section survey area includes the area downstream of Big Tujunga Dam to the Big Tujunga Canyon Road Bridge. The survey area and surrounding vicinity consist of open space in the Angeles National Forest.

Habitat in the upper section of Big Tujunga Creek is characterized by open sections of rocky stream with isolated patches of riparian vegetation. Big Tujunga Canyon burned during the 2009 Station Fire; thus, the riparian canopy is sparse through much of the creek. Dominant species in this portion of the survey area include mule fat (*Baccharis salicifolia*), arroyo willow (*Salix lasiolepis*), and red willow (*Salix laevigata*). Stands of white alder (*Alnus rhombifolia*) and occasional western sycamore (*Platanus racemosa*) and Fremont cottonwood (*Populus fremontii* ssp. *fremontii*) trees occurred throughout the reach with rough sedge (*Carex senta*) and California blackberry (*Rubus ursinus*) in the understory.

Riparian habitat in the lower section is characterized by relatively dense and continuous willow riparian forest dominated by mule fat, arroyo willow, and red willow with an overstory of white alder and Fremont cottonwood. Emergent vegetation, dominated by cattails (*Typha latifolia*), occurred as patches throughout this lower section. Common understory species include hoary nettle (*Urtica dioica* ssp. *holosericea*) and mugwort (*Artemisia douglasiana*). The riparian habitat in this lower section is considered higher quality for the flycatcher and vireo than the habitat in the upper section because it is more dense, mature, and contiguous.

Representative site photos are included in Attachment A.

Background

Southwestern Willow Flycatcher

The willow flycatcher (*Empidonax traillii*) is a State-listed Endangered species, whereas only the southwestern subspecies (*E.t. extimus*) is federally listed as Endangered (USFWS 1995). This survey focused on the southwestern willow flycatcher because it is the only subspecies that nests in Southern California. However, migrants of all the subspecies may occur in the area during spring and fall migration, so multiple visits to the survey area are required to determine if individuals observed during the first surveys are nesting birds.

The willow flycatcher was formerly a common summer resident in suitable habitat throughout California (Grinnell and Miller 1944). It has now been extirpated as a breeding bird from most of its California range, and is seriously threatened in Southern California primarily because of habitat loss and degradation, and brood parasitism by brown-headed cowbirds (*Molothrus ater*) (Garrett and Dunn 1981; USFWS 1995). The population of southwestern willow flycatcher in California is estimated to be about 172 territories at 96 sites (Durst et al. 2008). Within the Coastal California Recovery Unit, the population is estimated at 120 territories at 73 sites (Durst et. al. 2008). The southwestern willow flycatcher population has not shown the same recovery that the least Bell's vireo has shown in response to riparian habitat restoration and cowbird control (Kus 2011).

The willow flycatcher closely resembles other *Empidonax* flycatcher species in California, but the indistinct (or completely lacking) eye ring, broader and longer bill, and generally lighter appearance through the breast and throat help to distinguish it from other species. Although it cannot be used to formally identify the species, identification of the species' vocalizations is the best form of identification in the field. The southwestern willow flycatcher is a migratory bird, occurring in this region only during the breeding season (late May to early August). The male arrives later in the spring than most migrants, usually in mid- to late May or early June. Nests are constructed in thickets of trees and shrubs in a fork or horizontal branch between 3 and 15 feet above the ground.

The southwestern willow flycatcher breeds in riparian habitats along rivers, streams, or other wetlands in floodplains and broader canyons, preferring dense riparian thickets near surface water (Sogge et al. 2010), often with adjacent open areas for foraging. Vegetation structure, composition, and extent vary widely, but generally include extensive areas dominated by dense stands of willows (*Salix* spp.), mule fat, or other tree species (including tamarisk [*Tamarix* sp.] in some areas), usually with a scattered cottonwood (*Populus* sp.) overstory (USFWS 1995). These riparian areas provide both nesting and foraging habitat. Southwestern willow flycatchers will nest in areas with suitable habitat regardless of the elevation (from sea level to high mountains).

On October 19, 2005, the USFWS published a Final Rule designating critical habitat for the southwestern willow flycatcher (USFWS 2005). This Final Rule designates 120,824 acres in Arizona, California, Nevada, New Mexico, and Utah as critical habitat. Of that, 17,212 acres were designated in Kern, Santa Barbara, San Bernardino, and San Diego Counties, California. Following lawsuits, the USFWS recently proposed a revised critical habitat designation on August 15, 2011. This revised critical habitat covers 2,090 stream miles in California, Nevada, Utah, Colorado, Arizona, and New Mexico (USFWS 2011). The proposed rule used a slightly different methodology to designate critical habitat. For example, it includes areas that are considered essential for the recovery of the species even if they were not occupied at the time of the species' listing. The survey area is not located within designated critical habitat.

Least Bell's Vireo

The least Bell's vireo is a State and federally listed Endangered species. This subspecies was once widespread throughout the Central Valley and other low elevation riverine areas of California (Grinnell and Miller 1986). The widespread loss of riparian habitat and brood parasitism by the brown-headed cowbird are the major causes of the decline of this species (Garrett and Dunn 1981). About 76 percent of the U. S. population is found in just 5 localities. The breeding population in California has increased dramatically because of brown-headed cowbird trapping efforts in breeding areas, and they are thought to be expanding their current range (USFWS 1998). Continued cowbird control and exotic plant removal in riparian areas are considered necessary for the foreseeable future in order to continue this increasing trend (USFWS 2006).

The least Bell's vireo is a small grayish songbird with indistinct wing bars and facial markings. It is a very vocal species, and can be easily detected from some distance by its unique song, which is given repeatedly. The least Bell's vireo is migratory and only occurs in this region during the breeding season. The males arrive sometime in late March to April and establish breeding territories, and the females arrive shortly thereafter. Nests are constructed (usually in willow trees) only about three to four feet off the ground where the female will lay typically three to four eggs. The least Bell's vireo usually returns to the wintering grounds sometime in August to September. Preferred habitat is willow riparian woodland that supports dense understory thickets of scrubby willows and mule fat, especially within three to six feet of the ground (USFWS 1998).

On February 2, 1994, the USFWS issued their final determination of critical habitat for the least Bell's vireo (USFWS 1994), identifying approximately 37,560 acres as critical habitat in Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, and San Diego Counties. The survey area is located outside designated critical habitat for this species.

Survey Methodology

Prior to conducting the focused survey, the California Department of Fish and Game's (CDFG's) California Natural Diversity Database (CNDDB, CDFG 2012) and other references were reviewed to determine if and to what extent the southwestern willow flycatcher and least Bell's vireo are known to occur in the project region.

All focused surveys were conducted by Brian Leatherman (USFWS permit No. TE 827493-6; CDFG Memorandum of Understanding [MOU]) accompanied by either James Huelsman or Adam DeLuna, with the exception of the May 3, 2012, survey visit, which was conducted by Amber Oneal (USFWS permit No. TE 148554-2). Survey methods followed the guidelines developed by the U. S. Fish and Wildlife Service (USFWS), as described below. Observations of special status species were recorded in the field and waypoints were taken using Global Positioning System (GPS) technology for reporting purposes. The focus of the surveys was on the detection and identification of the target species, but all wildlife incidentally observed or detected was documented. A list of the species observed during the surveys is provided in Attachment B.

The USFWS protocol for the southwestern willow flycatcher requires a total of five surveys, with the first survey conducted between May 15 and May 31; the second and third surveys between June 1 and June 24; and the fourth and fifth surveys between June 25 and July 17 (Sogge et. al. 2010; USFWS 2000). The USFWS protocol for the least Bell's vireo requires that at least eight surveys be conducted from April 10 to July 31 with a ten-day interval between each site visit (USFWS 2001). Dates, times, and weather data for the focused surveys conducted on the upper section are shown in Table 1. Dates, times and weather data for the focused surveys conducted on the lower section are shown in Table 2.

TABLE 1
UPPER SECTION SURVEY DATES, TIMES, AND WEATHER CONDITIONS

				Weather Conditions*					
		Time		Temp (°F)		Winds (mph)		Cloud Cover	
Date	Survey No.	Start	End	Start	End	Start	End	Start	End
April 17	LBV1	7:00AM	11:30AM	55	79	2–4	0–2	clear	clear
April 27	LBV2	6:30AM	12:15PM	51	65	0–2	4–7	clear	clear
May 17	LBV3, WIFL1	6:30AM	11:30AM	63	79	0–2	2–4	clear	clear
June 7	LBV4, WIFL2	5:45AM	12:00PM	62	85	2–4	4–7	clear	clear
June 14	WILF3	6:00AM	12:00PM	62	76	0–2	4–7	clear	clear
June 28	LBV5, WIFL4	5:30AM	12:15PM	60	71	0–2	0–2	clear	clear
July 9	LBV6, WIFL5	7:00AM	11:30AM	68	96	0–2	2–4	clear	clear
July 19	LBV7	5:30AM	11:45AM	60	90	0–2	2–4	40%	5%
July 30	LBV8	6:00AM	10:45AM	65	85	0–1	2–4	clear	clear

°F: degrees Fahrenheit; mph: miles per hour; LBV: least Bell's vireo; WIFL: southwestern willow flycatcher.
* Temperature and wind speed measured with Kestrel 2000.

TABLE 2
LOWER SECTION SURVEY DATES, TIMES, AND WEATHER CONDITIONS

				Weather Conditions*					
		Time		Temp (°F)		Winds (mph)		Cloud Cover	
Date	Survey No.	Start	End	Start	End	Start	End	Start	End
April 19	LBV1	7:30AM	11:45AM	59	74	0–2	4–7	clear	clear
May 3	LBV2	6:45AM	10:05AM	60	65	0–5	0–5	75%	80%
May 16	LBV3, WIFL1	6:00AM	11:00AM	51	84	0–2	0–2	clear	clear
June 8	LBV4, WIFL2	6:00AM	11:00AM	53	73	0–2	2–4	clear	clear
June 15	WILF3	6:00AM	11:00AM	58	71	0–2	2–4	100%	clear
June 29	LBV5, WIFL4	6:00AM	11:15AM	61	74	0–2	0–2	clear	clear
July 10	LBV6, WIFL5	7:00AM	11:45AM	67	97	0–2	4–6	clear	clear
July 20	LBV7	7:00AM	10:30AM	65	78	1–2	2–3	clear	clear
July 31	LBV8	5:00AM	10:30AM	59	90	0–2	4–7	clear	clear

°F: degrees Fahrenheit; mph: miles per hour; LBV: least Bell's vireo; WIFL: southwestern willow flycatcher.
* Temperature and wind speed measured with Kestrel 2000

Survey Results

One willow flycatcher was observed in the lower section during the first focused survey on May 16. The bird did not respond to tape playback, did not exhibit territorial behavior, and flew off downstream. No willow flycatchers were observed during the subsequent four focused surveys. Interpretation of the survey results, based on the guidelines provided in Sogge et. al (2010), leads to the conclusion that the observed willow flycatcher was a migrant. The first two survey periods (May 15–31 and June 1–24) are conducted during a time when migrant willow flycatchers of all three California subspecies might occur in the region. Unless nesting behavior is observed during these first two periods, it is the final survey period (June 25 to July 17) in which detected birds are likely either breeding birds or non-breeding resident floaters (non-paired birds).

No southwestern willow flycatchers or least Bell's vireos were observed during the focused surveys. In addition, no nesting flycatchers or vireos have been reported in the CNDDB for the project vicinity (CDFG 2012), and none were observed in 2007 and 2008 during focused surveys for another project in the lower section (EDAW 2009a, 2009b). Based on the lack of records for the region, negative survey results in prior years, and the negative survey results reported here, the southwestern willow flycatcher and least Bell's vireo appear to be absent as breeders at this time. The Willow Flycatcher Survey and Detection Forms required by the protocol are included in Attachment C.

Other Observations

Four California Species of Special Concern[1] and one CDFG Watch List Species[2] were observed in the survey area: western pond turtle (*Emys marmorata*), two-striped garter snake (*Thamnophis hammondii*), loggerhead shrike (*Lanius ludovicianus*), yellow warbler (*Dendroica petechia*), and Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*). CNDDB forms will be submitted to the CDFG for these species (Attachment D).

Brown-headed cowbirds were observed in the riparian habitat in the upper and lower sections during most surveys. The most observed on any one day was three males and two females in the lower section on April 19. The most observed in the upper section was one male and one female on May 17.

BonTerra Consulting appreciates the opportunity to assist on this project. If you have any comments or questions, please call Amber Oneal at (714) 444-9199.

Sincerely,

BONTERRA CONSULTING

Ann M. Johnston
Principal, Biological Services

Amber S. Oneal
Senior Project Manager, Biological Services

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1 California Species of Special Concern are considered special status due to declining population levels, limited ranges, and/or continuing threats, which have made them vulnerable to extinction. Not all Species of Special Concern have declined equally; some species may be just starting to decline, while others may have already reached the point where they meet the criteria for listing.

2 CDFG Watch List Species are not on the current Special Concern list but (1) were on previous lists and they have not been State listed under California Endangered Species Act; (2) were previously State or federally listed and now are on neither list; or (3) are on the list of "Fully Protected" species.

I certify that the information in this survey report and enclosed exhibits fully and accurately presents my work.

Brian Leatherman
Senior Biologist
Permit No. TE827493-6

Enclosures: Exhibits 1, 2
Attachment A – Site Photos
Attachment B – Wildlife Compendium
Attachment C – Willow Flycatcher Survey and Detection Form
Attachment D – CNDDB Forms

cc: Eric Lim, Los Angeles County Department of Public Works

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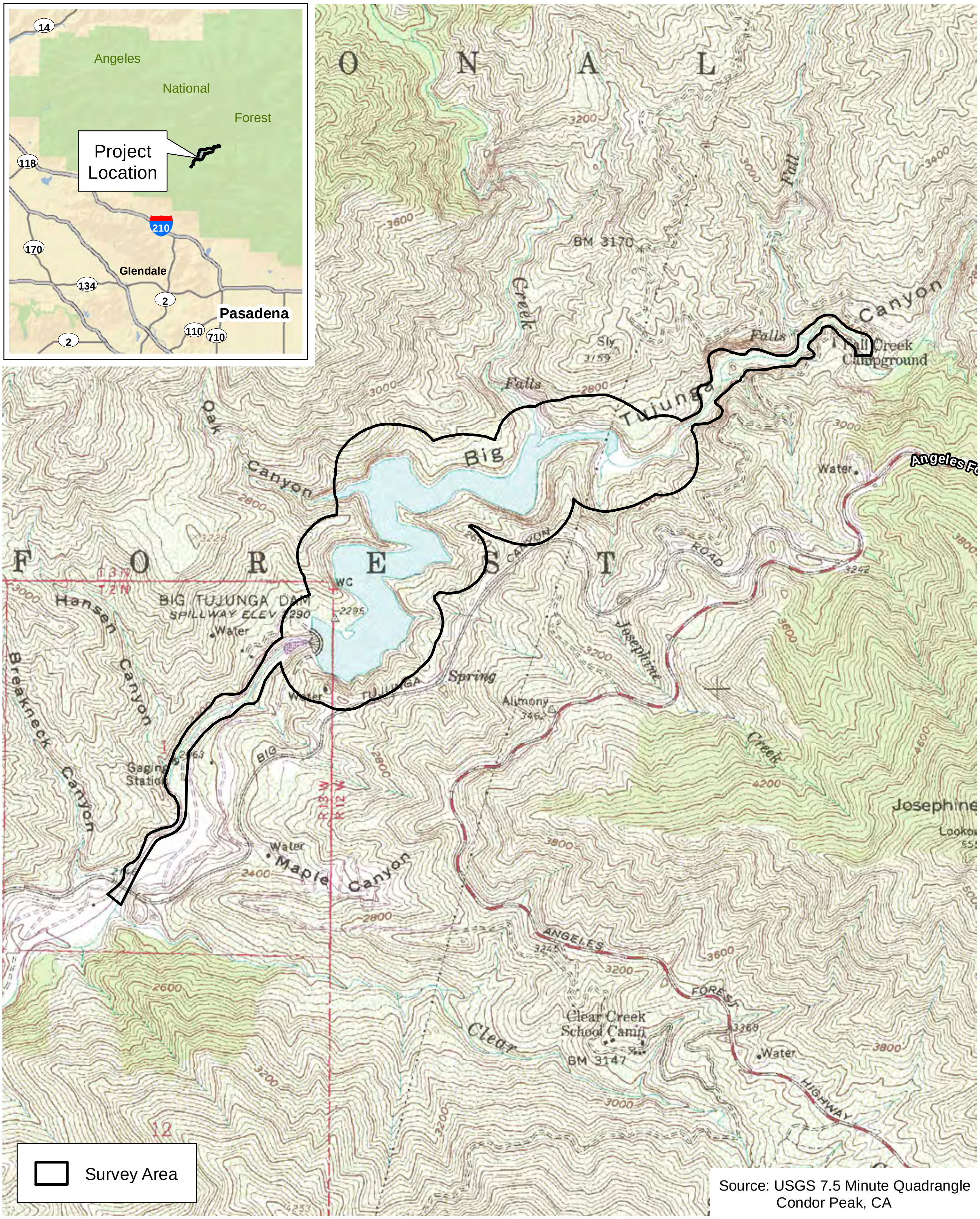
———. 1994 (February 2). Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Least Bell's Vireo. *Federal Register* 59(22): 4845–4867. Washington, D.C.: USFWS.



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Survey Area

Exhibit 1

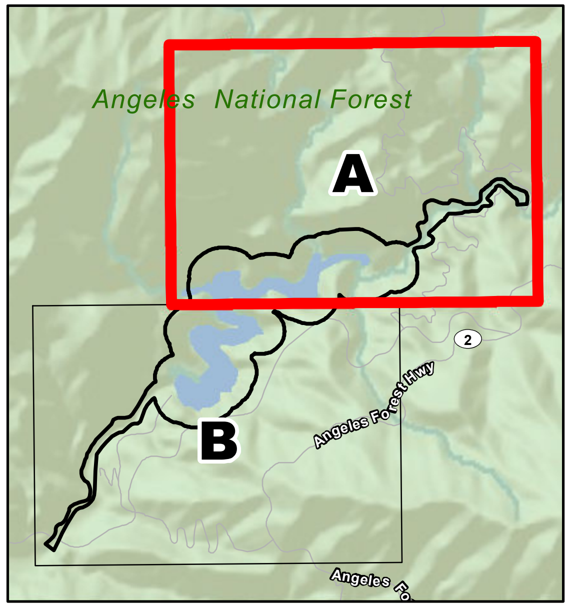
Big Tujunga Dam Sediment Removal Project

N
W E
S

2,000 1,000 0 2,000
Feet

BonTerra CONSULTING

(Rev: 5-04-2012 CJS) \PAS\Projects\CoLADPW\J187\Graphics\Ex_LBV_WIFL_notice.pdf



Survey Area

Aerial Source: LAR-IAC 2011

D:\Projects\CoLADPW\J187\mxd\LBV_WIFL\Ex_LBV_survey_area.mxd

Aerial View

Big Tujunga Dam Sediment Removal Project

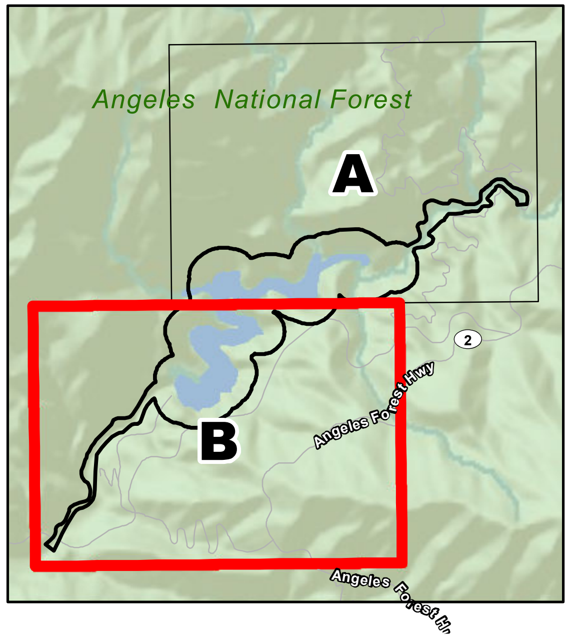
N W E S

800 400 0 800 Feet

Exhibit 2A

BonTerra CONSULTING

(Rev: 9-27-2012 CJS) Projects\CoLADPW\J167\Graphics\MND\Ex_Ex_bio_veg_impacts.pdf



Survey Area

Aerial Source: LAR-IAC 2011

D:\Projects\CoLADPW\J187\mxd\LBV_WIFL\Ex_LBV_survey_area.mxd

Aerial View

Exhibit 2B

Big Tujunga Dam Sediment Removal Project

N W E S

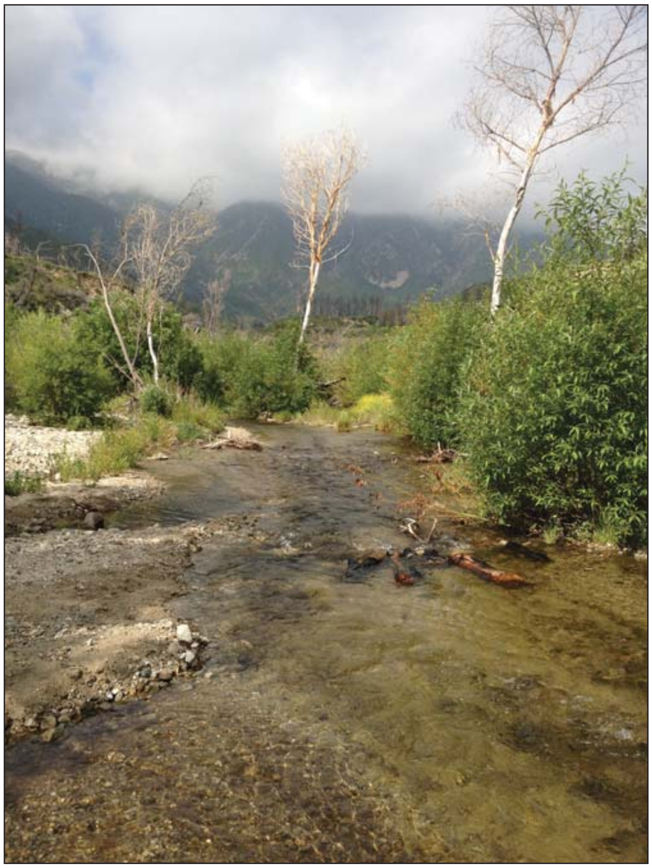
800 400 0 800 Feet

BonTerra CONSULTING

(Rev: 9-27-2012 CJS) Projects\CoLADPW\J167\Graphics\MND\Ex_Ex_bio_veg_impacts.pdf

ATTACHMENT A

SITE PHOTOS



View of willow scrub habitat along Big Tujunga Wash located downstream of the Dam.

View of willow scrub habitat along Big Tujunga Wash located downstream of the Dam.

PAS D:\Projects\CoLAPDW\J187\graphics\ex_AttA_sitephoto.ai

Site Photographs

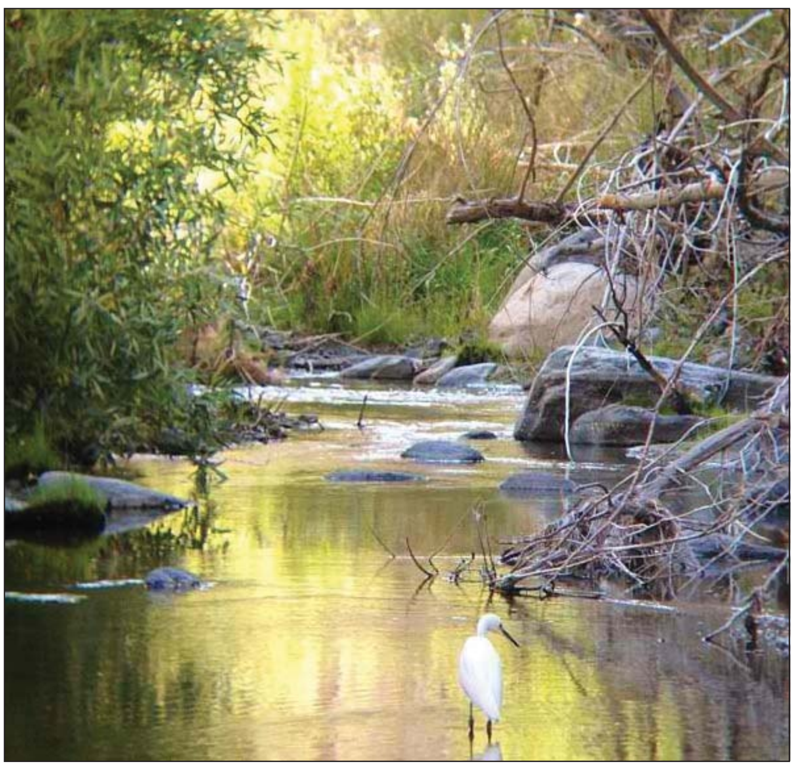
Attachment A-1

Big Tujunga Dam Sediment Removal Project

BonTerra CONSULTING

(Rev 10/02/12 KFD) PAS R: Projects\CoLADPW\J187\Graphics\LBV_WIFL_Rpt\ex_AttA1_site_photo.pdf

View of willow scrub habitat along Big Tujunga Creek located upstream of the Reservoir.



View of willow scrub habitat along Big Tujunga Creek located upstream of the Reservoir.

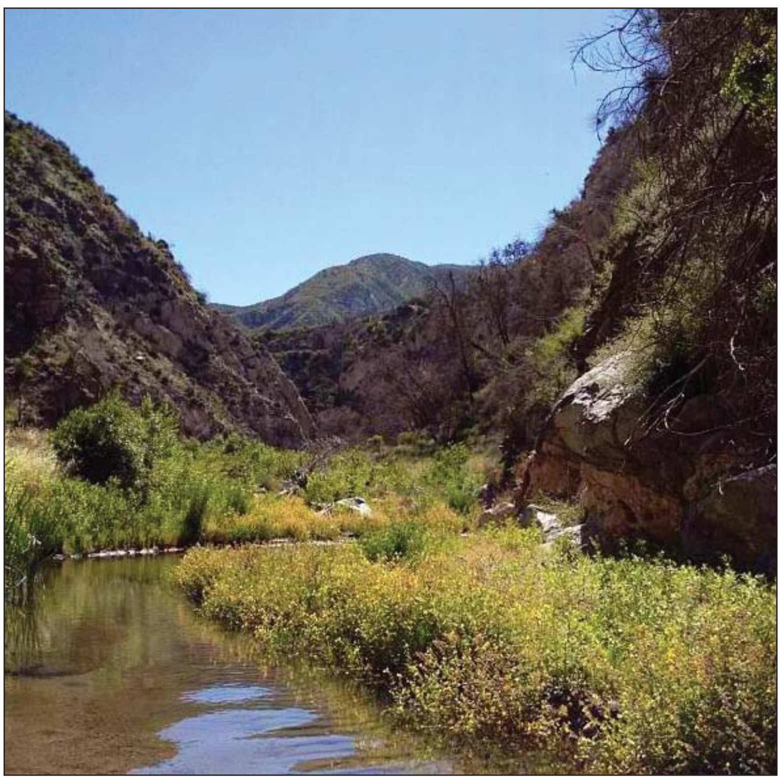
Site Photographs

Attachment A-2

Big Tujunga Dam Sediment Removal Project

BonTerra CONSULTING

View of willow scrub habitat along Big Tujunga Creek located upstream of the Reservoir.



View of willow scrub habitat along Big Tujunga Creek located upstream of the Reservoir.

PAS D:\Projects\CoLAPDW\J187\graphics\ex_AttA_site_photo3.ai

Site Photographs

Attachment A-3

Big Tujunga Dam Sediment Removal Project

BonTerra CONSULTING

(Rev 10/02/12 KFD) PAS R: Projects\CoLADPW\J187\Graphics\LBV_WIFL_Rpt\ex_AttA3_site_photo3.pdf

ATTACHMENT B

WILDLIFE COMPENDIUM

WILDLIFE SPECIES OBSERVED DURING LEAST BELL'S VIREO/SOUTHWESTERN WILLOW FLYCATCHER SURVEYS SPRING/SUMMER 2012

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	**AMPHIBIA**
Treefrogs and Allies	**Hylidae**
California treefrog	*Hyla cadaverina*
Pacific treefrog	*Hyla regilla*
True Frogs	**Ranidae**
* Bullfrog	*Rana catesbeiana*
REPTILES	**REPTILIA**
Box and Water Turtles	**Emydidae**
** Western pond turtle	*Emys marmorata*
Spiny Lizards, Horned Lizards, etc.	**Phrynosomatidae**
Western fence lizard	*Sceloporus occidentalis biseriatus*
Side-blotched lizard	*Uta stansburiana*
Whiptail Lizards	**Teiidae**
** Western whiptail	*Cnemidophorus tigris*
Colubrids	**Colubridae**
California whipsnake	*Masticophus lateralis*
** Two-striped garter snake	*Thamnophis hammondii*
BIRDS	**AVES**
Geese and Ducks	**Anatidae**
Mallard	*Anas platyrhynchos*
Hawks, Eagles and Kites	**Accipitridae**
** Cooper’s hawk	*Accipiter cooperii*
Red-tailed hawk	*Buteo jamaicensis*
Falcons	**Falconidae**
American kestrel	*Falco sparverius*
** Peregrine falcon	*Falco peregrinus*
Quail	**Odontophoridae**
Mountain quail	*Oreortyx pictus*
California quail	*Callipepla californica*
Sandpipers	**Scolopacidae**
Spotted sandpiper	*Actitus macularia*
Pidgeons and Doves	**Columbidae**
Band-tailed pidgeon	*Columba fasciata*
Mourning dove	*Zenaida macroura*
Swifts	**Apodidae**
White-throated swift	*Aeronautes saxatalis*
Hummingbirds	**Trochilidae**
Black-chinned hummingbird	*Archilochus alexandri*
Anna’s hummingbird	*Calypte anna*
** Costa’s hummingbird	*Calypte costae*
** Allen’s hummingbird	*Selasphorus sasin*
Woodpeckers	**Picidae**
Acorn woodpecker	*Melanerpes formicivorus*
** Nuttall’s woodpecker	*Picoides nuttallii*
Hairy woodpecker	*Picoides villosus*

WILDLIFE SPECIES OBSERVED DURING LEAST BELL'S VIREO/SOUTHWESTERN WILLOW FLYCATCHER SURVEYS SPRING/SUMMER 2012 (Continued)

COMMON NAME	SCIENTIFIC NAME
Northern flicker	*Colaptes auratus*
Tyrant Flycatchers	**Tyrannidae**
Western wood-pewee	*Contopus sordidulus*
Hammond's flycatcher	*Empidonax hammondii*
Pacific-slope flycatcher	*Empidonax difficilis*
Black phoebe	*Sayornis nigricans*
Say's phoebe	*Sayornis saya*
Ash-throated flycatcher	*Myiarchus cinerascens*
Western kingbird	*Tyrannus verticalis*
Shrikes	**Laniidae**
** Loggerhead shrike	*Lanius ludovicianus*
Vireos	**Vireonidae**
Warbling vireo	*Vireo gilvus*
Jays and Crows	**Corvidae**
Western scrub-jay	*Aphelocoma californica*
Common raven	*Corvus corax*
Swallows	**Hirundinidae**
Violet-green swallow	*Tachycineta thalassina*
Northern rough-winged swallow	*Stelgidopteryx serripennis*
Cliff swallow	*Petrochelidon pyrrhonota*
Titmice and Chickadees	**Paridae**
** Oak (Plain) titmouse	*Baeolophus inornatus*
Bushtits	**Aegithalidae**
Bushtit	*Psaltriparus minimus*
Wrens	**Troglodytidae**
Rock wren	*Salpinctes obsoletus*
Canyon wren	*Catherpes mexicanus*
Bewick's wren	*Thryomanes bewickii*
House wren	*Troglodytes aedon*
Dippers	**Cinclidae**
American dipper	*Cinclus mexicanus*
Gnatcatchers	**Silviidae**
Blue-gray gnatcatcher	*Polioptila caerula*
Bluebirds and Thrushes	**Turdidae**
Western bluebird	*Sialia mexicana*
American robin	*Turdus migratorius*
Wrentits	**Timaliidae**
Wrentit	*Chamaea fasciata*
Mockingbirds and Thrashers	**Mimidae**
Northern mockingbird	*Mimus polyglottis*
California thrasher	*Toxostoma redivivum*
Starlings	**Sturnidae**
* European starling	*Sturnus vulgaris*

WILDLIFE SPECIES OBSERVED DURING LEAST BELL'S VIREO/SOUTHWESTERN WILLOW FLYCATCHER SURVEYS SPRING/SUMMER 2012 (Continued)

COMMON NAME	SCIENTIFIC NAME
Silky Flycatchers	**Ptilogonatidae**
Phainopepla	*Phainopepla nitens*
Wood Warblers	**Parulidae**
Orange-crowned warbler	*Vermivora celata*
** Yellow warbler	*Dendroica petechia*
Yellow-rumped warbler	*Dendroica coronata*
Common yellowthroat	*Geothlypis trichas*
Wilson's warbler	*Wilsonia pusilla*
Tanagers	**Thraupidae**
Western tanager	*Piranga ludoviciana*
Towhees and Sparrows	**Emberizidae**
Spotted towhee	*Pipilo maculatus*
California towhee	*Pipilo crissalis*
** Rufous-crowned sparrow	*Aimophila ruficeps*
** Chipping sparrow	*Spizella passerina*
** Black-chinned sparrow	*Spizella atrogularis*
Lark sparrow	*Chondestes grammacus*
Song sparrow	*Melospiza melodia*
Lincoln's sparrow	*Melospiza lincolnii*
White-crowned sparrow	*Zonotrichia leucophrys*
Golden-crowned sparrow	*Zonotrichia atricapilla*
Dark-eyed junco	*Junco hyemalis*
Grosbeaks and Buntings	**Cardinalidae**
Black-headed grosbeak	*Pheucticus melanocephalus*
Blue grosbeak	*Guiraca caerulea*
Lazuli bunting	*Passerina amoena*
Blackbirds and Orioles	**Icteridae**
Red-winged blackbird	*Agelaius phoeniceus*
* Brown-headed cowbird	*Molothrus ater*
Hooded oriole	*Icterus cucullatus*
Bullock's oriole	*Icterus bullockii*
Finches	**Fringillidae**
House finch	*Carpodacus mexicanus*
Lesser goldfinch	*Carduelis psaltria*
** Lawrence's goldfinch	*Carduelis lawrencei*
American goldfinch	*Carduelis tristis*
MAMMALS	**MAMMALIA**
Squirrels	**Sciuridae**
California ground squirrel	*Spermophilus beecheyi*
Pocket Gophers	**Geomyidae**
Botta's pocket gopher (burrows)	*Thomomys bottae*

WILDLIFE SPECIES OBSERVED DURING LEAST BELL'S VIREO/SOUTHWESTERN WILLOW FLYCATCHER SURVEYS SPRING/SUMMER 2012 (Continued)

COMMON NAME	SCIENTIFIC NAME
Old World Rats and Mice	**Muridae**
Dusky-footed woodrat (nest)	*Neotoma fuscipes*
Dogs, Wolves and Foxes	**Canidae**
Coyote (scat, tracks)	*Canis latrans*
Raccoons	**Procyonidae**
Common raccoon (tracks)	*Procyon lotor*
Weasels and Allies	**Mustelidae**
Striped skunk (odor)	*Mephitis mephitis*
Deer	**Cervidae**
Mule deer	*Odocoileus hemionus*

* non-native species
** CDFG's Special Animals

Note: Other species may have been overlooked or inactive/absent because of the season (amphibians are active during rains, reptiles during summer, some birds (and bats) migrate out of the area for summer or winter, some mammals hibernate etc.). Taxonomy and nomenclature generally follow NABA (2002) for butterflies, Stebbins (2003) for amphibians and reptiles, AOU (1998) for birds, and Jones et al. (1992) for mammals.

ATTACHMENT C

WILLOW FLYCATCHER SURVEY AND DETECTION FORM

Willow Flycatcher (WIFL) Survey and Detection Form (revised April, 2010)

Site Name: **Big Tujunga (Upper Section)** State: **CA** County: **LA**

USGS Quad Name: **Condor Peak** Elevation: **714** (meters)

Creek, River, or Lake Name: **Big Tujunga Creek**

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? *Yes* **X** *No* ____

Survey Coordinates: Start: E **0393234m** N **3796611m** UTM Datum: **NAD83** (See instructions)

Stop: E **392043m** N **3796273m** UTM Zone: **11S**

If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.

*****Fill in additional site information on back of this page*****

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding;-potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.
Survey # 1 Observer(s): Brian Leatherman	Date: 5/17/2012 Start: 6:30 Stop: 11:30 Total hrs: 5.0	0					# Birds / Sex / UTM E / UTM N
Survey # 2 Observer(s): Brian Leatherman	Date: 6/7/2012 Start: 5:45 Stop: 12:00 Total hrs: 6.2	0					# Birds / Sex / UTM E / UTM N
Survey # 3 Observer(s): Brian Leatherman	Date: 6/14/2012 Start: 6:00 Stop: 12:00 Total hrs: 5.0	0					# Birds / Sex / UTM E / UTM N
Survey # 4 Observer(s): Brian Leatherman	Date: 6/28/2012 Start: 5:30 Stop: 12:15 Total hrs: 6.8	0					# Birds / Sex / UTM E / UTM N
Survey # 5 Observer(s): Brian Leatherman	Date: 7/9/2012 Start: 7:00 Stop: 11:30 Total hrs: 4.5	0					# Birds / Sex / UTM E / UTM N

Overall Site Summary	Total Adult Residents	Total Pairs	Total Territories	Total Nests	
Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals. Total survey hrs: 27.5	0				Were any WIFLs color-banded? Yes ____ No **N/A** If yes, report color combination(s) in the comments section on back of form and report to USFWS.

Reporting Individual: **Brian Leatherman** Date Report Completed: **8/1/2012**

US Fish & Wildlife Service Permit #: **TE827493-7** State Wildlife Agency Permit #: **SC-001562**

***Submit** form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.*

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual **Brian Leatherman** Phone # **(714)701-0863**
Affiliation **Leatherman BioConsulting Inc.** E-mail bleathermanwlb@aol.com
Site Name **Big Tujunga Reservoir** Date report Completed **8/1/2012**
Was this site surveyed in a previous year? Yes____ No_X_ Unknown____
Did you verify that this site name is consistent with that used in previous yrs? Yes____ No____ Not Applicable X
If name is different, what name(s) was used in the past? ____
If site was surveyed last year, did you survey the same general area this year? Yes____ No____ If no, summarize below.
Did you survey the same general area during each visit to this site this year? Yes X No____ If no, summarize below.

Management Authority for Survey Area: Federal X Municipal/County X State____ Tribal____ Private____
Name of Management Entity or Owner (e.g., Tonto National Forest) **LADPW, ANF**

Length of area surveyed: **2.2** (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

X Native broadleaf plants (entirely or almost entirely, > 90% native)
____ Mixed native and exotic plants (mostly native, 50 - 90% native)
____ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)
____ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific name.
Alnus rhombifolia, Populus fremontii, Salix spp

Average height of canopy (Do not include a range): **4.5** (meters)

Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections;
2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests;
3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features. Attach additional sheets if necessary.
Habitat consist of rocky stream with patches of alders and willows. Occassional cottonwoods and willows. Generally considered marginal habitat for WIFL because of the small isolated patches of riparian habitat.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

Willow Flycatcher (WIFL) Survey and Detection Form (revised April, 2010)

Site Name: **Big Tujunga Dam (Lower Section)** State: **CA** County: **LA**

USGS Quad Name: **Condor Peak** Elevation: **629** (meters)

Creek, River, or Lake Name: **Big Tujunga Creek**

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? *Yes* **X** *No* ____

Survey Coordinates: Start: E **0390563m** N **3795314m** UTM Datum: **NAD83** (See instructions)

Stop: E **0389819m** N **3794239m** UTM Zone: **11S**

If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.

*****Fill in additional site information on back of this page*****

Survey # Observer(s) (Full Name)	Date (m/d/y) Survey Time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding;-potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator.	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.
Survey # 1 Observer(s): Brian Leatherman	Date: 5/16/2012 Start: 6:00 Stop: 11:00 Total hrs: 5.0	1	0	0	N	One individual observed considered a migrant (not observed during subsequent surveys)	# Birds / Sex / UTM E / UTM N
Survey # 2 Observer(s): Brian Leatherman	Date: 6/8/2012 Start: 6:00 Stop: 11:00 Total hrs: 5.0	0					# Birds / Sex / UTM E / UTM N
Survey # 3 Observer(s): Brian Leatherman	Date: 6/15/2012 Start: 6:00 Stop: 11:00 Total hrs: 5.0	0					# Birds / Sex / UTM E / UTM N
Survey # 4 Observer(s): Brian Leatherman	Date: 6/29/2012 Start: 6:00 Stop: 11:15 Total hrs: 5.2	0					# Birds / Sex / UTM E / UTM N
Survey # 5 Observer(s): Brian Leatherman	Date: 7/10/2012 Start: 7:00 Stop: 11:45 Total hrs: 4.8	0					# Birds / Sex / UTM E / UTM N

Overall Site Summary	Total Adult Residents	Total Pairs	Total Territories	Total Nests	
Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals.	0	0	0	0	Were any WIFLs color-banded? Yes ____ No **X**
Total survey hrs: 25.0					If yes, report color combination(s) in the comments section on back of form and report to USFWS.

Reporting Individual: **Brian Leatherman** Date Report Completed: **8/1/2012**

US Fish & Wildlife Service Permit #: **TE827493-7** State Wildlife Agency Permit #: **SC-001562**

***Submit** form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.*

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual **Brian Leatherman** Phone # **(714)701-0863**
Affiliation **Leatherman BioConsulting Inc.** E-mail bleathermanwlb@aol.com
Site Name **Big Tujunga Reservoir** Date report Completed ______
Was this site surveyed in a previous year? Yes____ No_X__ Unknown____
Did you verify that this site name is consistent with that used in previous yrs? Yes ____ No ____ Not Applicable X
If name is different, what name(s) was used in the past? ______
If site was surveyed last year, did you survey the same general area this year? Yes ____ No X If no, summarize below.
Did you survey the same general area during each visit to this site this year? Yes X No ____ If no, summarize below.

Management Authority for Survey Area: Federal X Municipal/County X State ____ Tribal ____ Private ____
Name of Management Entity or Owner (e.g., Tonto National Forest) **LADPW, ANF**

Length of area surveyed: **1.8** (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

X Native broadleaf plants (entirely or almost entirely, > 90% native)

____ Mixed native and exotic plants (mostly native, 50 - 90% native)

____ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)

____ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific name.
Alnus rhombifolia, Populus fremontii, Salix spp

Average height of canopy (Do not include a range): 7 (meters)

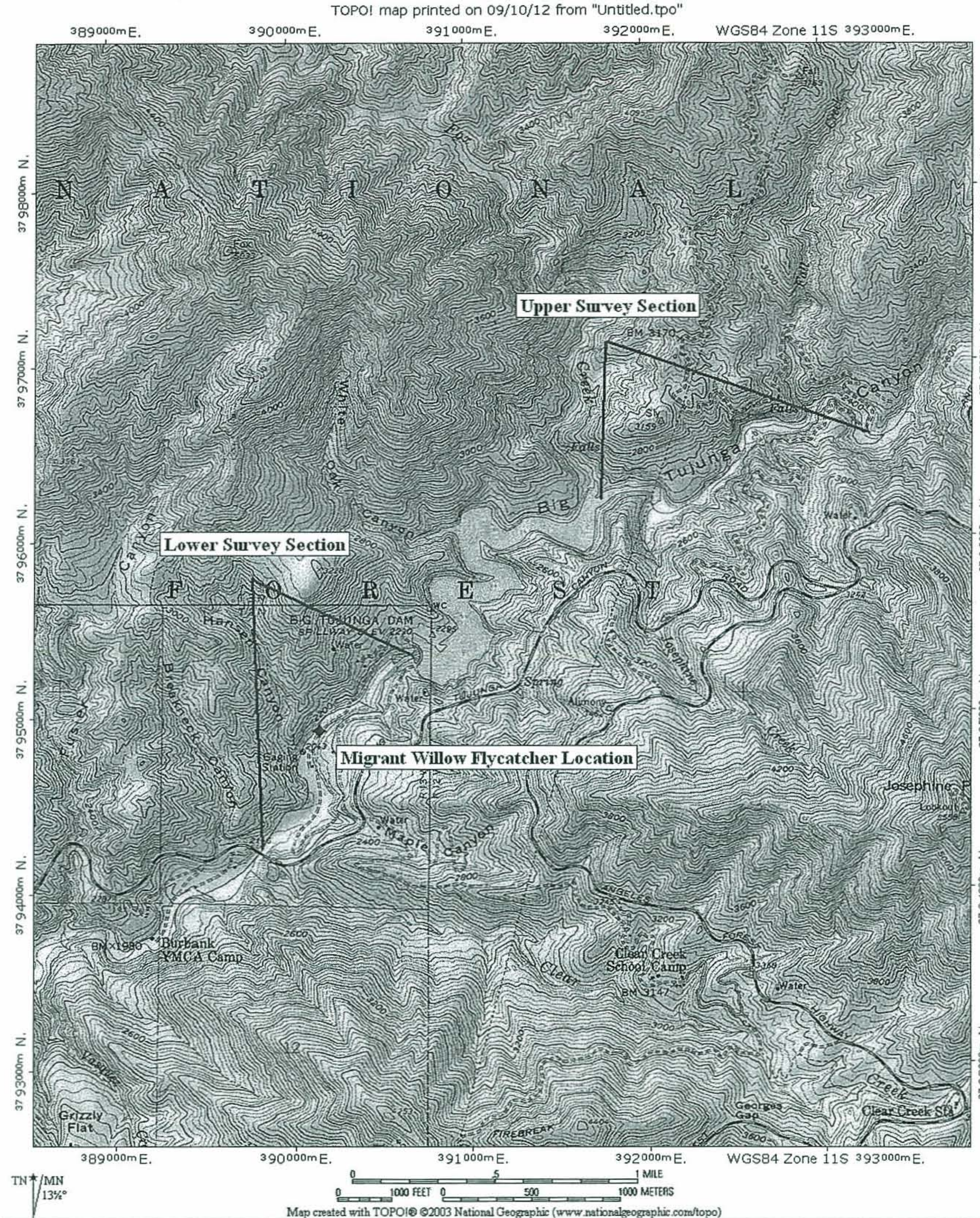
Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections;
2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests;
3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features. Attach additional sheets if necessary.
Habitat consists of nearly continuous but narrow strip of willows along rocky stream with patches of alders and occassional cottonwoods. Generally considered marginal habitat for WIFL. Surveyed in 2007 and 2008 by EDAW, negative LBVI and WIFL.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary



Big Tujunga Reservoir Sediment Removal Project

Survey Locations
Figure 1

LEATHERMAN BIOCONSULTING, INC.
Biological Surveys, Management & Monit.

Source: TOPO! Condor Peak USGS quadrangle

ATTACHMENT D

CNDDB FORMS

Mail to:
California Natural Diversity Database
Department of Fish and Game
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: (916) 324-0475 email: CNDDB@dfg.ca.gov

Date of Field Work (mm/dd/yyyy): 05/16/2012

For Office Use Only
Source Code ______ Quad Code ______
Elm Code ______ Occ. No. ______
EO Index No. ______ Map Index No. ______

Reset

California Native Species Field Survey Form

Send Form

Scientific Name: *Emys marmorata*

Common Name: Western Pond Turtle

Species Found? ☑ Yes ☐ No ______ If not, why?
Total No. Individuals 4 Subsequent Visit? ☐ yes ☐ no
Is this an existing NDDB occurrence? ______ Yes, Occ. # ☐ no ☑ unk.
Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: Brian Leatherman
Address: 5622 Amberdale Drive
Yorba Linda, CA 92886
E-mail Address: bleathermanwlb@aol.com
Phone: (714) 701-0863

Plant Information
Phenology: ___% vegetative ___% flowering ___% fruiting

Animal Information
4 # adults ___ # juveniles ___ # larvae ___ # egg masses ___ # unknown
☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☑ other

***Location Description* (please attach map AND/OR fill out your choice of coordinates, below)**
Turtles observed downstream of the Big Tujunga Dam (within the LADPW dam operations area), and upstream of the Big Tujunga Dam Reservoir in the Angeles National Forest.

County: Los Angeles Landowner / Mgr.: Angeles National Forest, LADPW
Quad Name: Condor Peak Elevation: ______
T___ R___ Sec ___, ___ ¼ of ___ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T___ R___ Sec ___, ___ ¼ of ___ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Oregon 400t
DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy ______ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ **OR** Geographic (Latitude & Longitude) ☐
Coordinates: 0390069mE, 3794749mN

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*
Open rocky montane stream. All four pond turtles were observed basking on rocks along the edge of the stream.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor
Immediate AND surrounding land use: Big Tujunga Dam management area.
Visible disturbances:
Threats: Dam maintenance activities.
Comments: One individual upstream of Big Tujunga Dam observed on 4/27/2012 and three individuals downstream of Big Tujunga Dam on 5/16/2012.

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): ______
☐ Compared with specimen housed at: ______
☐ Compared with photo / drawing in: ______
☐ By another person (name): ______
☐ Other: Experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes☐ no☐

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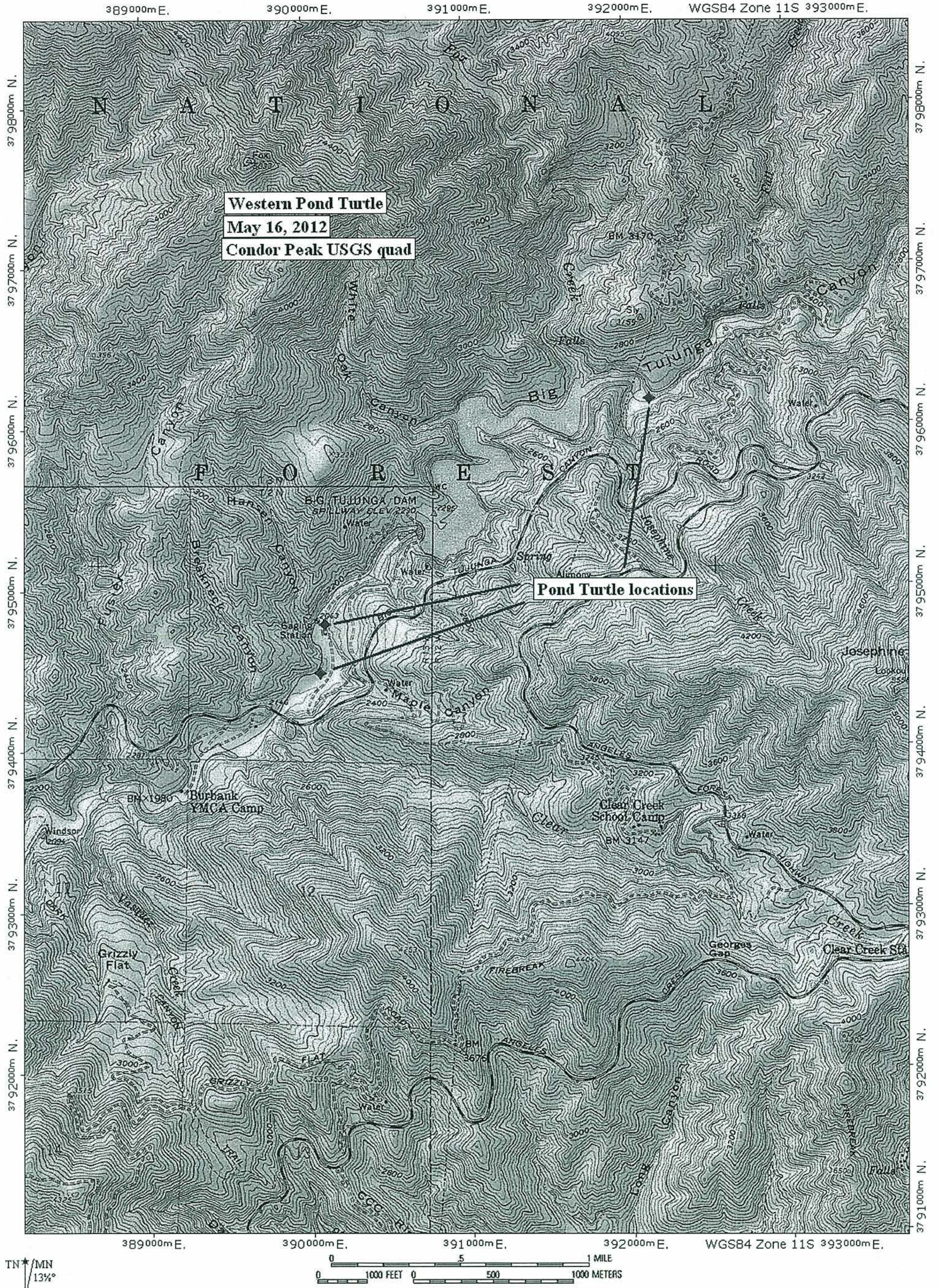

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Mail to:
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Date of Field Work (mm/dd/yyyy): 07/09/2012

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Elm Code ____ Occ. No. ____
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Scientific Name: *Thamnophis hammondii*

Common Name: Two-striped garter snake

Species Found? ☑ Yes ☐ No ____ If not, why?

Total No. Individuals 5 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? ____ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: ____ Number ____ Museum / Herbarium

Reporter: Brian Leatherman

Address: 5622 Amberdale Drive
Yorba Linda, CA 92886

E-mail Address: bleathermanwlb@aol.com

Phone: (714) 701-0863

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

4 # adults; 1 # juveniles; ____ # larvae; ____ # egg masses; ____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Five snakes observed upstream of the Big Tujunga Dam Reservoir in the Angeles National Forest.

County: Los Angeles Landowner / Mgr.: Angeles National Forest, LADPW

Quad Name: Condor Peak Elevation: 2355 feet

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Oregon 400t

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy ____ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ **OR** Geographic (Latitude & Longitude) ☐

Coordinates: 0392935mE, 3796642mN

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Open rocky montane stream. All five two-striped garter snakes were observed foraging within the stream.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Big Tujunga Dam management area.

Visible disturbances:

Threats: Dam maintenance activities.

Comments: One juvenile observed on 6/7, one adult on 6/14, and three adults on 7/9/2012.

Determination: *(check one or more, and fill in blanks)*

☐ Keyed (cite reference): ____
☐ Compared with specimen housed at: ____
☐ Compared with photo / drawing in: ____
☐ By another person (name): ____
☑ Other: Experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes ☐ no ☐

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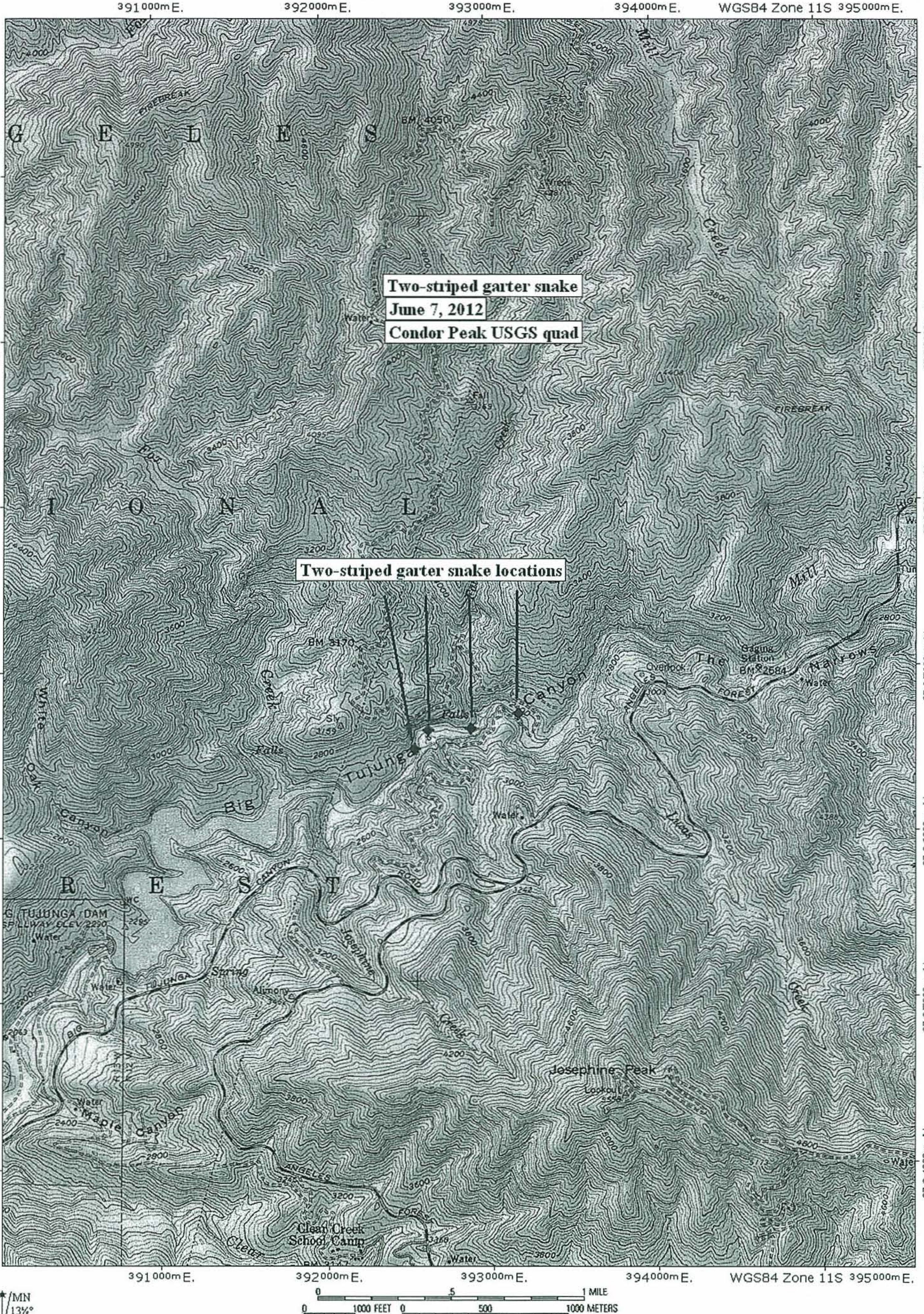

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Scientific Name: *Lanius ludovicianus*

Common Name: Loggerhead shrike

Species Found? ☑ Yes ☐ No ____ If not, why?

Total No. Individuals 1 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? ____ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: ____ Number ____ Museum / Herbarium

Reporter: Brian Leatherman
Address: 5622 Amberdale Drive
Yorba Linda, CA 92886
E-mail Address: bleathermanwlb@aol.com
Phone: (714) 701-0863

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

1 # adults ____ # juveniles ____ # larvae ____ # egg masses ____ # unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

***Location Description* (please attach map AND/OR fill out your choice of coordinates, below)**

Downstream of the Big Tujunga Dam within the fenced LADPW dam management area.

County: Los Angeles Landowner / Mgr.: Angeles National Forest, LADPW
Quad Name: Condor Peak Elevation: 2135 feet
T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS
T____ R____ Sec ____, ____ ¼ of ____ ¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Oregon 400t
DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy ____ meters/feet
Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ **OR** Geographic (Latitude & Longitude) ☐
Coordinates: 0390040mE, 3794388mN

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Cut slope with ruderal non-native annual grassland and scattered native shrubs above stream.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Big Tujunga Dam management area.

Visible disturbances:

Threats: Dam maintenance activities.

Comments: Observed one bird on 6/8/2012.

Determination: *(check one or more, and fill in blanks)*
☐ Keyed (cite reference): ____
☐ Compared with specimen housed at: ____
☐ Compared with photo / drawing in: ____
☐ By another person (name): ____
☑ Other: Experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes☐ no☐

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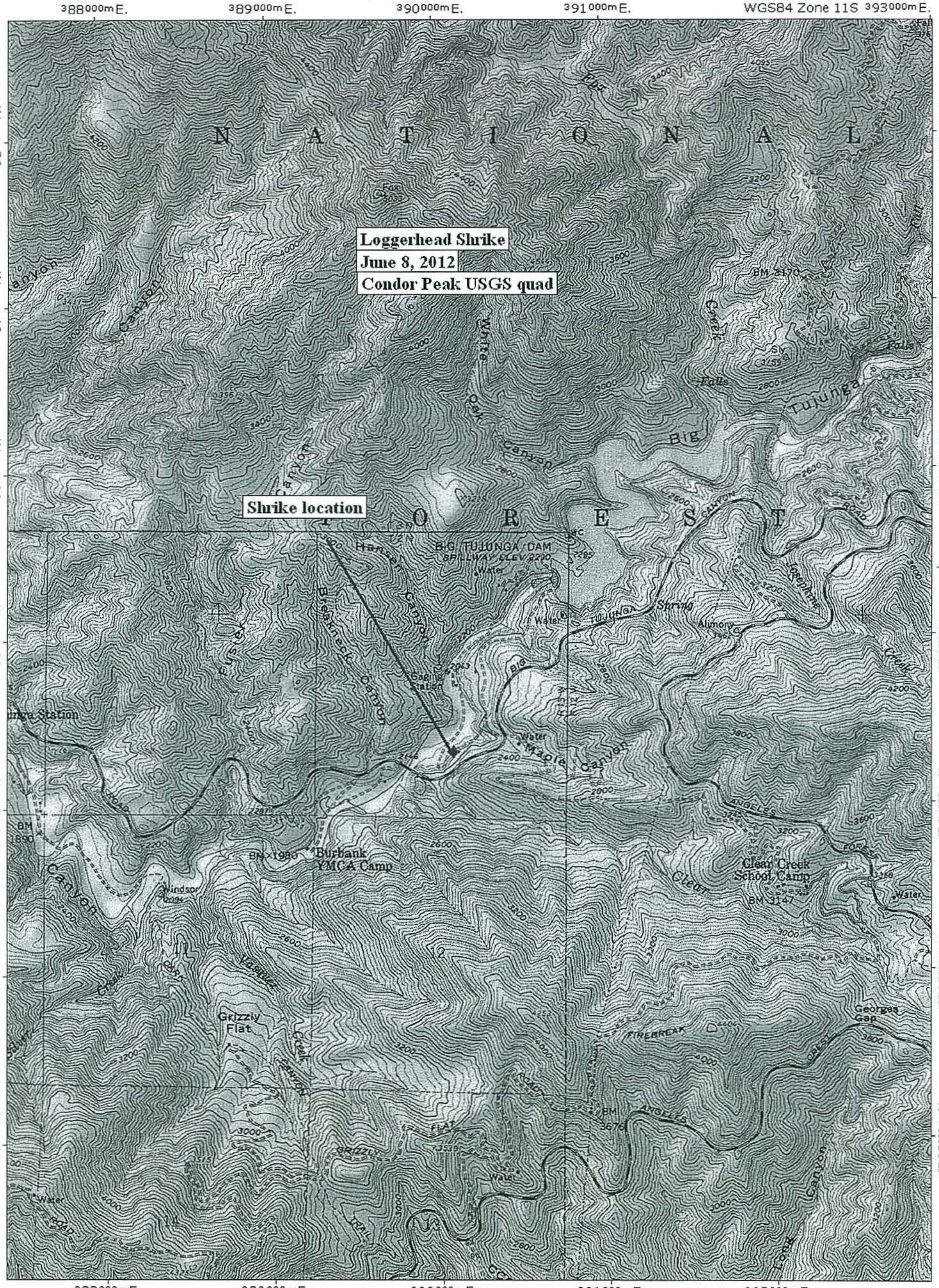

TN / MN 13½°

0 .5 1 MILE

0 1000 FEET 0 500 1000 METERS

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Scientific Name: Dendroica petechia

Common Name: Yellow warbler

Species Found? ☑ Yes ☐ No ______ If not, why?

Total No. Individuals 9 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? ______ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: Brian Leatherman
Address: 5622 Amberdale Drive
Yorba Linda, CA 92886
E-mail Address: bleathermanwlb@aol.com
Phone: (714) 701-0863

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

# adults	# juveniles	# larvae	# egg masses	# unknown
9				

☐ wintering ☑ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description* *(please attach map AND/OR fill out your choice of coordinates, below)

Upstream of the Big Tujunga Dam Reservoir, and downstream of the Big Tujunga Dam.

County: Los Angeles Landowner / Mgr.: Angeles National Forest, LADPW

Quad Name: Condor Peak Elevation: 2080 feet

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Oregon 400t

DATUM: NAD27 ☐ NAD83 ☑ WGS84 ☐ Horizontal Accuracy ______ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 0390070mE, 3794650mN

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior (Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):

Mostly open rocky stream with cottonwood willow riparian forest. Several territorial males singing along the two reaches, although nesting not observed directly.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Angeles National Forest

Visible disturbances:

Threats:

Comments: 4-6 singing males along habitat downstream of dam, 3-5 territorial males upstream of reservoir. These birds likely represent breeding pairs.

Determination: *(check one or more, and fill in blanks)*

- ☐ Keyed (cite reference): ______
- ☐ Compared with specimen housed at: ______
- ☐ Compared with photo / drawing in: ______
- ☐ By another person (name): ______
- ☑ Other: Experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes☐ no☐

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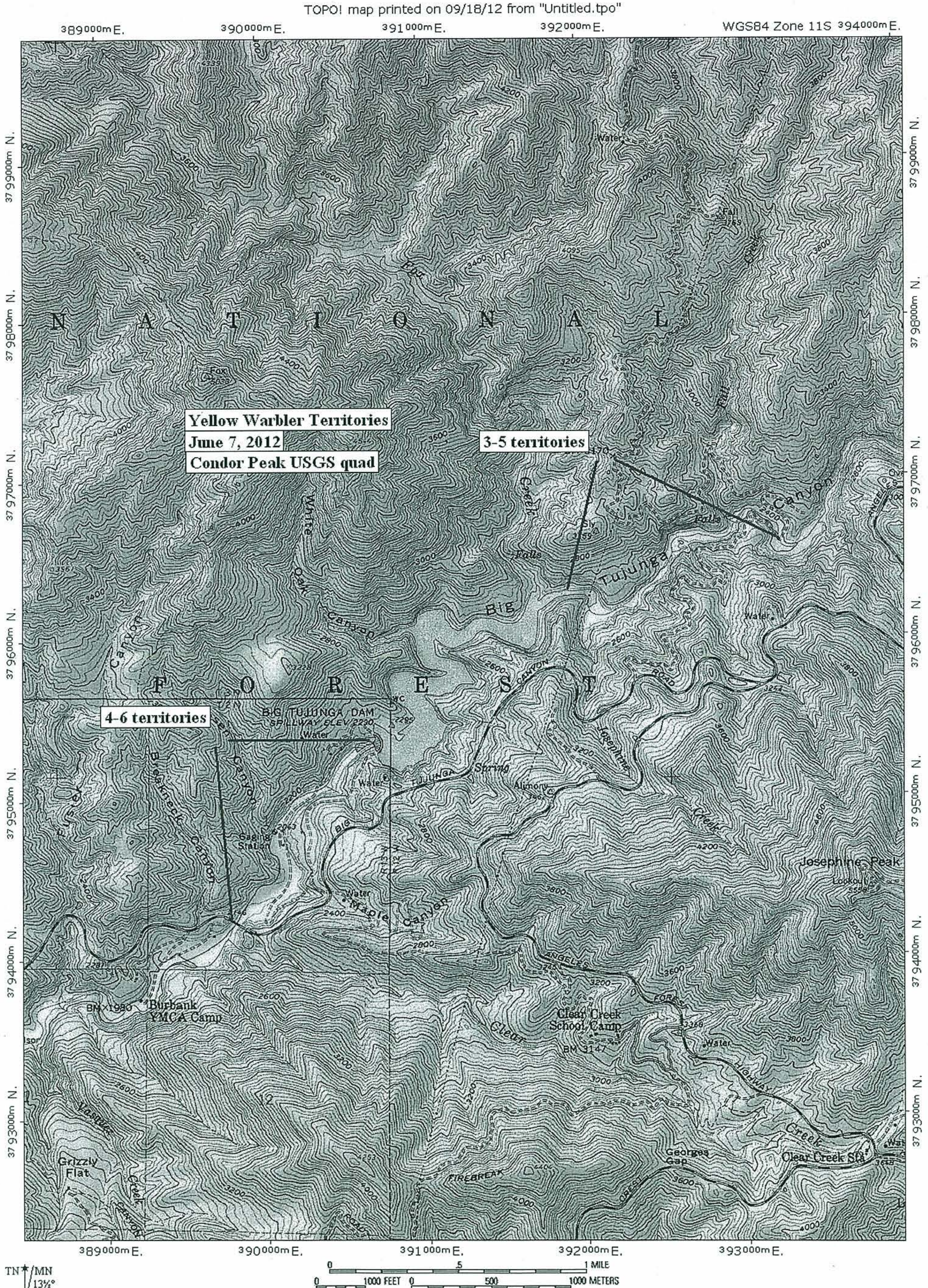

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Scientific Name: *Aimophila ruficeps*

Common Name: Rufous-crowned sparrow

Species Found? ☑ Yes ☐ No ______ If not, why?

Total No. Individuals 1 Subsequent Visit? ☐ yes ☐ no

Is this an existing NDDB occurrence? ______ Yes, Occ. # ☐ no ☑ unk.

Collection? If yes: ______ Number ______ Museum / Herbarium

Reporter: Brian Leatherman
Address: 5622 Amberdale Drive
Yorba Linda, CA 92886
E-mail Address: bleathermanwlb@aol.com
Phone: (714) 701-0863

Plant Information

Phenology: ____% vegetative ____% flowering ____% fruiting

Animal Information

1				
# adults	# juveniles	# larvae	# egg masses	# unknown

☐ wintering ☐ breeding ☐ nesting ☐ rookery ☐ burrow site ☐ other

Location Description ***(please attach map AND/OR fill out your choice of coordinates, below)***

Upstream of the Big Tujunga Dam Reservoir, half way down old access road (now closed) to Fall Creek Campground in Angeles National Forest.

County: Los Angeles Landowner / Mgr.: Angeles National Forest, LADPW

Quad Name: Condor Peak Elevation: 2900 feet

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ Source of Coordinates (GPS, topo. map & type): GPS

T____ R____ Sec ____, ____ ¼ of ____¼, Meridian: H☐ M☐ S☐ GPS Make & Model Garmin Oregon 400t

DATUM: **NAD27** ☐ **NAD83** ☑ **WGS84** ☐ Horizontal Accuracy ______ meters/feet

Coordinate System: UTM Zone 10 ☐ UTM Zone 11 ☑ ***OR*** Geographic (Latitude & Longitude) ☐

Coordinates: 0392550mE, 3795910mN

Habitat Description (plants & animals) *plant communities, dominants, associates, substrates/soils, aspects/slope:*
Animal Behavior *(Describe observed behavior, such as territoriality, foraging, singing, calling, copulating, perching, roosting, etc., especially for avifauna):*

Rugged mountain slope along road cut, recently burned chaparral on predominantly north facing slope.

Please fill out separate form for other rare taxa seen at this site.

Site Information Overall site/occurrence quality/viability (site + population): ☐ Excellent ☑ Good ☐ Fair ☐ Poor

Immediate AND surrounding land use: Angeles National Forest

Visible disturbances:

Threats:

Comments:

Determination: *(check one or more, and fill in blanks)*

- ☐ Keyed (cite reference): ______
- ☐ Compared with specimen housed at: ______
- ☐ Compared with photo / drawing in: ______
- ☐ By another person (name): ______
- ☑ Other: Experience with species

Photographs: *(check one or more)*

	Slide	Print	Digital
Plant / animal	☐	☐	☐
Habitat	☐	☐	☐
Diagnostic feature	☐	☐	☐

May we obtain duplicates at our expense? yes☐ no☐

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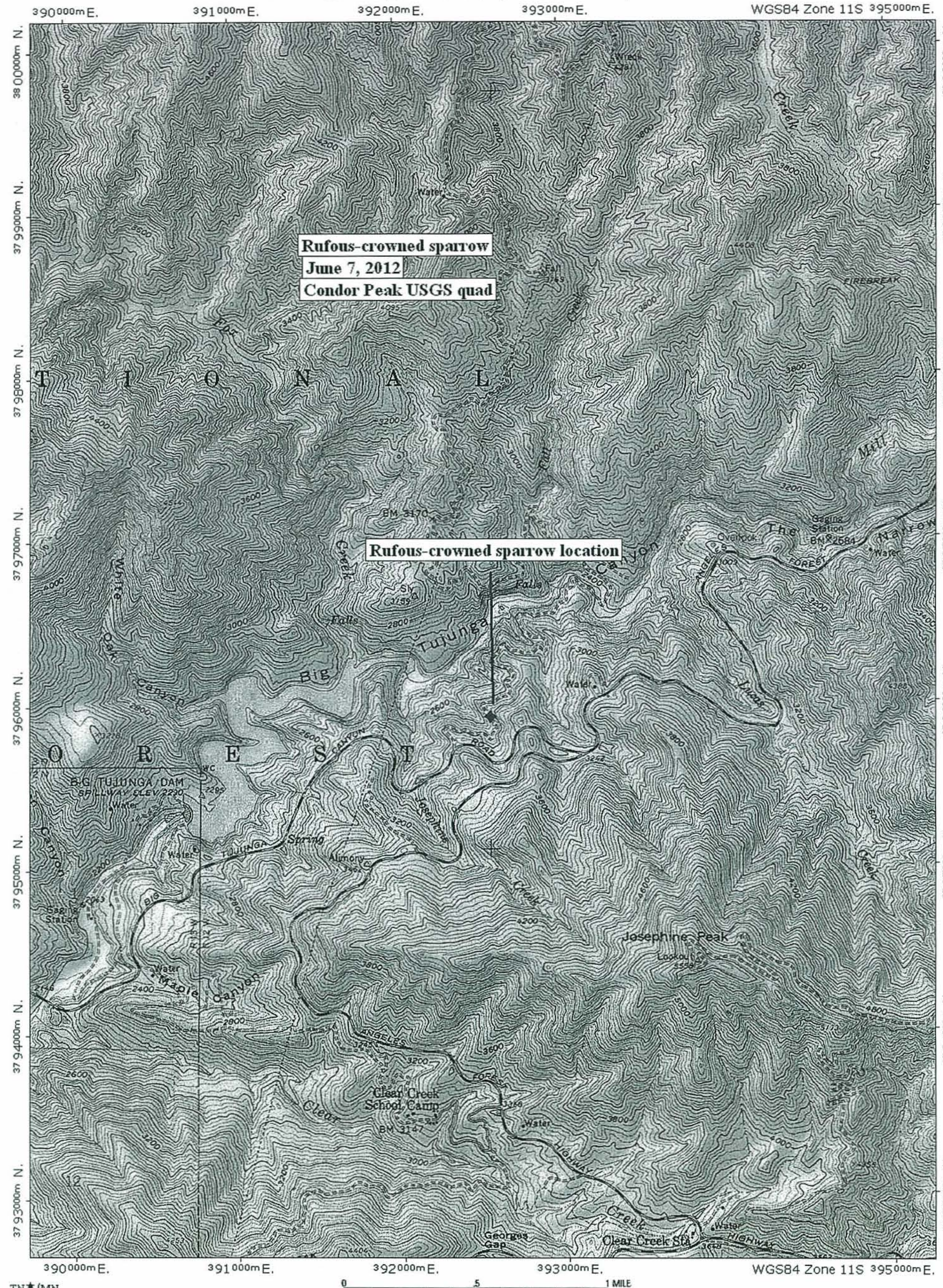

TN / MN 13½°

0 .5 1 MILE
0 1000 FEET 0 500 1000 METERS

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APPENDIX B-9

FLOW DATA ANALYSIS MEMO

BonTerra
CONSULTING

MEMORANDUM

January 24, 2013

To:
Mr. Eric Lim, P.E.
Water Resources Division
Los Angeles County Department of Public Works

From:
Carl Demetropoulos
Senior Fisheries Biologist
BonTerra Consulting

Subject: Flow Data Analysis for the Big Tujunga Reservoir Sediment Removal Project, Los Angeles County, California

---

Dear Mr. Lim:

The purpose of this Memorandum is to analyze potential impacts of the proposed sediment removal activities at the Big Tujunga Reservoir and the associated changes in reservoir water releases on the Santa Ana sucker (*Catostomus santaanae*), a federally Threatened fish species that inhabits Big Tujunga Creek below Big Tujunga Dam. With respect to the Santa Ana sucker, there are two potential impacts of concern: (1) maximum water releases during dewatering and (2) lack of operational releases during the dry season. An analysis of the project's anticipated effects on the Santa Ana sucker are discussed below in this Memorandum.

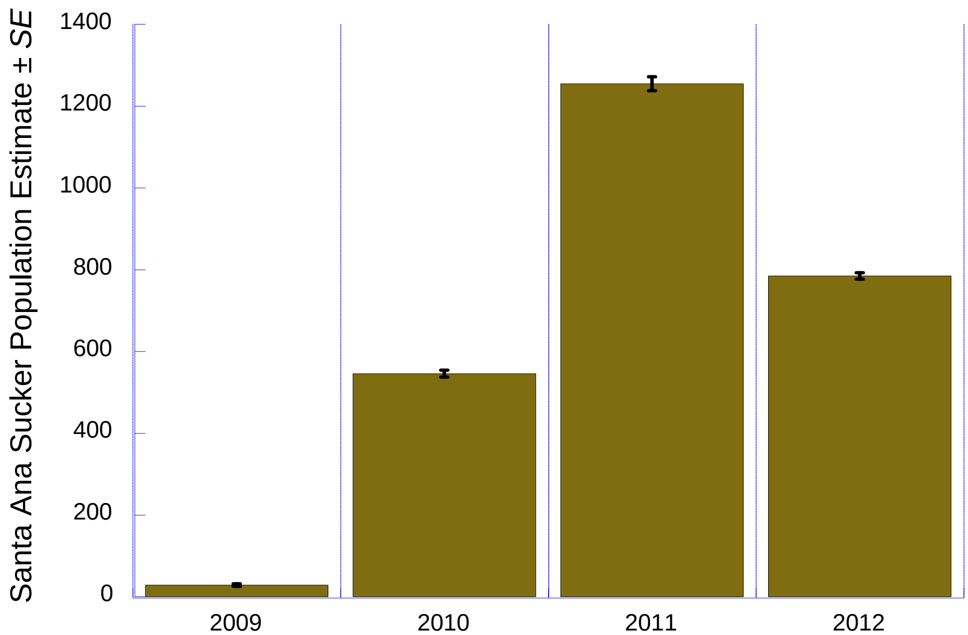
EXISTING CONDITIONS

Santa Ana Sucker Background

The Santa Ana sucker is known to occur in Big Tujunga Creek just downstream of the plunge pool (BonTerra Consulting 2011, 2012, 2013). Santa Ana sucker typically begins to breed (i.e., lay eggs/spawn) in March and April and continue breeding through mid-August (Moyle 2002).

Figure 1 shows Santa Ana sucker populations for 18–22 reaches in Big Tujunga Creek below the dam as described in the 2009–2012 Santa Ana sucker long-term monitoring conducted during September and October of each year by San Marino Environmental Associates (SMEA) and BonTerra Consulting (SMEA 2010a, 2010b; BonTerra Consulting 2012, 2013). In this study, a series of 25-meter reaches are sampled in order to assess the sucker population within Big Tujunga Creek. It should be noted that the first year of sucker population surveys (2009) followed the Station Fire and population counts were extremely low that year; since then, the sucker population has been increasing (Figure 1).

Figure 1
Santa Ana Sucker Population Estimates
September/October 2009–2012



Regular water releases from Big Tujunga Dam are part of Santa Ana sucker ecology in Big Tujunga Creek. Typically, dam releases track what occurs naturally; during a storm, higher flows are released, while during a dry year, lower flows are released. However, the dam operations buffer the Santa Ana sucker somewhat from natural conditions by: (1) dampening high storm flows during the rainy season, and (2) providing water releases during the dry season for water conservation purposes. The Los Angeles County Department of Public Works (LACDPW) has been participating in the Santa Ana Sucker Working Group (SASWG) in order to adaptively manage releases to minimize adverse effects and to increase beneficial effects of releases on the sucker population.

Historic Average Annual Reservoir Reductions

On an annual basis during the storm season, the reservoir flows are released on an as-needed basis, particularly after a large storm event, to ensure adequate capacity behind the dam. These large dam releases during the rainy season are illustrated by the high mean flows in January, February, and March shown in Figure 2 below, which shows average releases for each month of the year from the reservoir from 1999 to 2012. Per discussions with County staff, the dam operators typically release flows from the dam to reach a “minimum pool” by April 15th (i.e., the end of the rainy season) (Mahulikar 2013).

Figure 2
Mean Annual Flow Rates From 1999 Through 2012 ± Standard Error (SE)

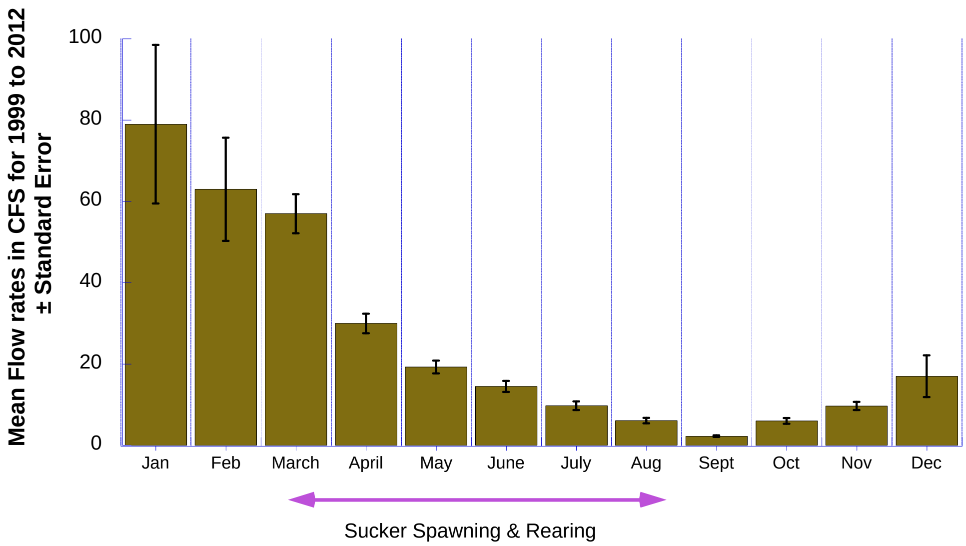
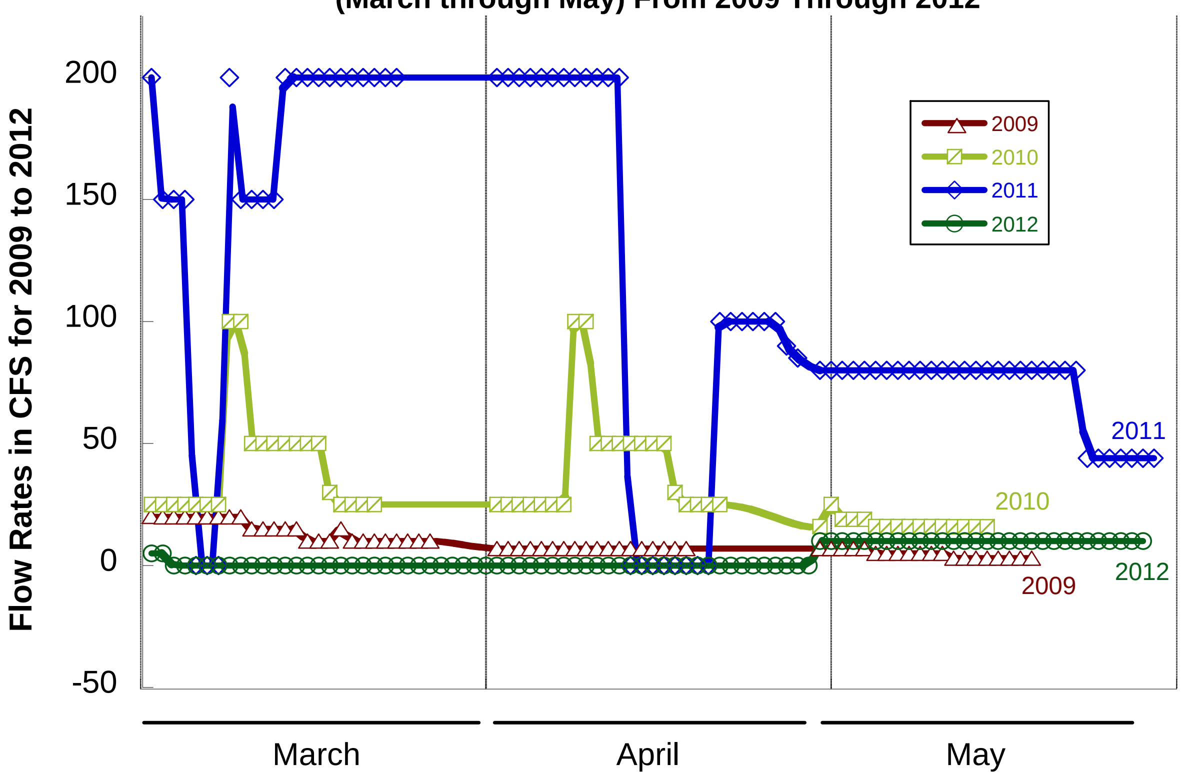


Figure 3
Flow Rates as a Function of Release Dates (March through May) From 2009 Through 2012[1]



[1] Missing days of flow rate data were assumed to have flow rates equal to days immediately prior to and after those days

Flow data is available that can be compared to the same years as the Santa Ana sucker population survey data (Figures 1 and 3). As illustrated in Figure 3, March 13, 2011 through April 12, 2011 had the highest flow releases of any of the four years of data analyzed. During this time period, a total of 27 of 31 days were at releases of 200 cubic feet per second (cfs), with the remaining 4 days at 150 cfs.

PROJECT DEWATERING PROGRAM

The reservoir is expected to be at a minimum pool elevation of currently estimated at 2,188 ft at the end of the rainy season (April 15th). During each year of sediment removal, dewatering activities would start on or shortly after April 15th. The Contractor would be responsible for two initial tasks: (1) installing a bypass line to direct inflow from upstream of the reservoir into the plunge pool thus "bypassing" the work area in the reservoir, and (2) dewatering the plunge pool and relocating any special status fish[2] from the plunge pool to downstream areas. These efforts are anticipated to take approximately five days.

As the fish relocation efforts are occurring, all valves would be closed; no water releases would occur from the dam into the plunge pool. During this time, recession flows (inflow into the reservoir) would pond behind the dam. Wet and average season recession flows (which are estimated through modeling) show that, in a wet year, the reservoir would rise to elevation of 2,221 feet and in an average year, the reservoir would rise to 2,207 feet (calculated using the average recession flow rates). In a dry year, the flows would be negligible. For the purpose of preparing a conservative analysis with respect to potential impacts to the SAS, only the wet year scenario (i.e., rainfall greater than 32 inches) is considered. The wet year scenario would require the most water to be released from the dam, thus, it is the worst-case scenario that should be evaluated with respect to the Santa Ana sucker. The average inflow to Big Tujunga Reservoir during the months of April and May in a wet year is estimated to be 72.5 cfs.

Table 1 presents the proposed dewatering schedule for a typical wet year; it should be noted that timing and intensity of storms of the rainy season could modify the schedule. This is the anticipated schedule that LACDPW would adhere to during a wet year to dewater the reservoir after April 15th. As previously mentioned, per discussions with County staff, the dam operators typically release flows from the dam to reach a "minimum pool" by April 15th; therefore, dam operations prior to April 15th are considered to be a part of typical operations and are not considered to be dewatering activities associated with the Project.

[2] Arroyo chub (*Gila orcutti*) and Santa Ana speckled dace (*Rhinichthys osailolus*) are known to occur in the plunge pool. Santa Ana sucker has not been found within the plunge pool, but is known to occur in the Big Tujunga creek just below the plunge pool.

TABLE 1
PROPOSED "WET YEAR" DEWATERING SCHEDULE

Day	Time	Dam Flows	Estimated Elevation
1	All Day	None (Close Valves)	2,188
2	All Day	None (Close Valves)	–
3	All Day	None (Close Valves)	–
4	All Day	None (Close Valves)	–
5	All Day	None (Close Valves)	2,221
6	8:00 am to 3:00 pm	Ramp from15 cfs to 60 cfs	2,222
7	8:00 am to 3:00 pm	Ramp from 75 cfs to 100 cfs	2,221
8	All Day	120 cfs	2,220
9	All Day	140 cfs	2,216
10	All Day	160 cfs	2,210
11	All Day	180 cfs	2,202
12	8:00 am to 5:00 pm	180 cfs*	2,188
13	All Day	82.5 cfs	–
14	All Day	82.5 cfs	–
15	All Day	82.5 cfs	–
16	All Day	82.5 cfs	–
17	All Day	82.5 cfs	–
18	All Day	82.5 cfs	–
19	All Day	82.5 cfs	–
20	All Day	82.5 cfs	–
21	All Day	82.5 cfs	–
22	All Day	82.5 cfs	–
23	All Day	82.5 cfs	–
24	All Day	82.5 cfs	–
25	12:00 am to 3:00 am	82.5 cfs	2170

Although not specifically shown through a change in valve pressure in this table, the flows would ramp down naturally as the water approaches elevation 2,188 feet (current minimum pool) and there is less water pressure from water in the reservoir (Chimienti 2013).

The Contractor would begin dewatering the plunge pool and installing the water diversion system no sooner than April 15th. For five days, the Contractor would dewater the plunge pool and begin to install the bypass line and upstream cofferdam. A qualified Biologist would perform fish relocation in the plunge poolif needed. During these five days, all valves on the dam would remain closed and inflow to the reservoir would pond behind the dam. Although the valves to the dam would be closed, pumping to dewater the plunge pool and leakage from the dam would still provide water to Big Tujunga Creek downstream of the dam.

At the end of the 5 days, ponded water would have reached elevation of 2,221 feet based on an average inflow of 72.5 cfs in a wet year. At this time, Valve A-1 would be used to release water starting at 15 cfs and ramping flows up to 180 cfs (Table 1). It would take approximately 5 days of ramping flows to reach an outflow of 180 cfs. After 1 additional day of releasing at 180 cfs, the water elevation would be below the elevation of the inlet riser for Penstock 1, which is 2,188 feet. At this time, either Valve 2 would be used or pumps would be used to continue to dewater the reservoir. Therefore, in total, approximately 5 days of ramping releases from 0 to 160 cfs, and 2 additional days of releases at 180 cfs, would be required to dewater the reservoir in a wet year from an elevation of 2,221 feet to an elevation of 2,188 feet. Flows would ramp down (decrease) naturally as the water approaches minimum pool since there will be less water pressure from the depth of water in the reservoir to push flow through the outlet. (Chimienti 2013).

At this point, the Contractor would have completed installation of the upstream bypass line (a high density polyethylene pipe), and inflows to the reservoir would then be diverted past the reservoir directly into Penstock 1 or 2. The Contractor would use a floating barge and pumps to continue to dewater the reservoir from an elevation of 2,188 feet to the top of sediment elevation at 2,170 feet. The pumps would release approximately 10 cfs through either Penstock 1 or 2. The pumped water would combine with the bypass water for a total of approximately 82.5 cfs, and this outflow would continue for approximately 13 days until the reservoir is completely dewatered to an elevation of 2,170 feet (i.e., the sediment level) (Table 1). In total, the dewatering process in a wet year would take a minimum of 25 days; however, only 2 days would include releases of 180 cfs. It should be noted that this time frame is an estimate only; dewatering activities may take longer if late season storms occur late in the rainy season or after April 15th.

Dewatering activities in Year 2 and subsequent years would be similar to those in Year 1. Penstock 1 would be used to dewater the reservoir until it reaches an elevation of 2,202 feet or at the elevation of the Penstock 1 inlet riser. In order to dewater the reservoir from the elevation at 2,202 feet to the sediment level, the hydraulic slide gate may be used if the sediment in the vicinity of the gate has been removed during the previous season’s sediment-removal activities.

POTENTIAL DEWATERING IMPACTS TO SANTA ANA SUCKER

A threshold (i.e., maximum) of this species’ tolerance to storm or other high water flows has not yet been established. If dewatering occurs at a rate similar to a typical storm, the Santa Ana sucker can likely withstand the higher volume flows for a limited period of time. However, if dewatering flows are large enough for an extended period of time, they could displace suckers and their eggs downstream, affecting their breeding activity. In order to determine whether dewatering would affect the Santa Ana sucker, the maximum storm flow releases from the dam during the months of March and April (see Figure 3) were compared to recent Santa Ana sucker population counts (see Figure 1) recorded during long-term monitoring efforts for the Santa Ana sucker in 2009–2012 (SMEA 2010a, 2010b; BonTerra Consulting 2012, 2013).

Within the time period for which there is sucker population data, only one year (2011) had high flows for consecutive days (Figure 3). Between March 13 and April 12, 2011, 27 of 31 days included releases of 200 cfs, with the remaining 4 days at 150 cfs. This time period corresponds to the survey results in September/October 2011, which indicate that Santa Ana sucker populations were at their highest numbers (Figure 1). When examining the data by size class, the number of juveniles observed in 2011 was not significantly different from the number of juveniles observed in 2010 or 2012; the number of adults was not significantly different from the number of adults observed in 2012 and was greater than the number of adults observed in 2010 (BonTerra Consulting 2013).The data does not indicate sucker populations were impacted by increased flows from the dam during March–April 2011. Moreover, flows up to 200 cfs for 27 days during 2011 correlate to relatively strong sucker population numbers 5 months later.

It should be noted that, while the Santa Ana sucker breeding season begins in March or April, it continues into May and even into the summer months if conditions are suitable. It is not known whether the high flows for extended periods of time have any effect on sucker breeding, potentially by delaying the spawning until May. It is possible that historic high releases during a wet year result in conditions that would be suitable for the sucker to continue breeding into the later spring and early summer months, thereby offsetting potential negative effects caused by high flows in the early spring.

While one year maximum flow data is not enough to draw conclusions for the species' tolerance range, it can be assumed that the Santa Ana sucker was able to persist during the previous periods of extremely high flows (e.g., 2005, 2006). This relationship can be further examined as additional years of sucker population data are collected for the Santa Ana Sucker Working Group.

The proposed dewatering regime flow rate recommendation (i.e., maximum of 180 cfs) is within the range of flows and the below the maximum flow (i.e. 200 cfs) experienced by the Santa Ana sucker in 2011 (and during previous wet years), and is therefore not expected to affect the sucker population. As shown in Table 1, Dam operations would 'ramp' flows (i.e., step-wise increases and decreases) to mimic natural stream hydrology.

Dewatering Impact Conclusion

Flow data show that 31 days of relatively high flows (i.e., March 13, 2011–April 12, 2011) did not cause a reduction in the Santa Ana sucker population count the following fall (October 2011); therefore, it can be assumed that future flow rates at this same level and for a similar interval of time would not negatively impact the Santa Ana sucker population. As such, the proposed Dewatering Program with only two days of releases at 180 cfs after April 15th (Table 1) is not expected to impact the Santa Ana sucker population.

It should be noted that appropriate sediment controls would be in place to ensure that increased flow velocity and reservoir dewatering would not cause increased siltation impacts. The breeding season is a critical time of year for Santa Ana sucker, when egg-laying, hatching of larva, and fry rearing occur. It is critical for Best Management Practices for sediment control operate effectively because silt has the potential to smother lithic diatoms (algae) critical to the growth of early life-stages of the sucker and can cause fouling of gills in larvae and juvenile sucker. The Biological Monitor would inspect the sediment controls in the plunge pool and at the outflow into the creek downstream of the plunge pool to ensure that these protective measures are functioning properly.

DRY SEASON BYPASS FLOWS

During sediment removal, flows from Big Tujunga Creek would be taken in a bypass line around the reservoir and released into the plunge pool. Therefore, the inflow into the bypass line from the creek above the reservoir would equal the amount of outflow from the bypass downstream of the dam. During this time, the Santa Ana sucker would be completely dependent on natural flows; there would be no water in the reservoir to release to supplement the creek flows. As under natural conditions in a dry year, the stream could dry up and strand the sucker in small puddles, and could kill the sucker if the stream becomes too shallow or dries completely.

During typical operating procedures, the LACDPW generally releases water from the reservoir at the same rate as the inflow into the reservoir (Chimienti 2012); thus, the stream flows mimic natural conditions during the dry season. A t-test analysis was performed on inflow/outflow data[3] during the months of May, June, July, August, and September to verify whether water releases during the dry season have typically equaled inflow to the reservoir. While this time period included a wide range of natural variation with both extremely dry and wet years, the analysis verifies that inflow typically equals outflow. September was the only month to show an inflow vs. outflow difference, with a mean outflow of 0.60 cfs compared to inflow of 1.6 cfs ($p < 0.0001$), which suggests that, on average, September may provide more water during bypass operations than has typically been released in this month.

Dry Season Bypass Flows Impact Conclusion

Although Santa Ana sucker population estimates were not available until 2009, the flow data between 1999 and 2012 show that there were multiple cycles of dry years and wet years, and the Santa Ana suckers were able to persist through dry years (e.g., 2002, 2007, and 2012). Additionally, as shown from the long-term monitoring data to date (2009–2012), the Santa Ana sucker population is able to recover from disturbance relatively quickly. For example, following the Station Fire in 2009, the Santa Ana sucker only occurred in two reaches (EDAW and SMEA 2009), but by 2011, they had expanded to 17 of the 18 reaches surveyed (BonTerra Consulting 2012) . Therefore, if there is a dry year and Santa Ana sucker die off (as would be expected under natural conditions [i.e. without the dam in place impounding additional water] in a dry year), the Santa Ana sucker have the capacity to recover from the disturbance within a few years. Based on observable historic data, the bypass system (inflow equal to outflow) is not expected to negatively impact the Santa Ana sucker.

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[3] It should be noted that inflow data was measured in the morning once per day compared to gauge measurements continuously taken for outflow data; continuous inflow data is not available.

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APPENDIX C

PHASE 1 CULTURAL RESOURCES ASSESSMENT

Phase I Cultural Resources Assessment

Big Tujunga Reservoir Sediment Removal Project

Big Tujunga Reservoir Sediment Removal Project: USGS **Condor Peak** 7.5 Minute Quadrangle in Township 2 and 3 North; Range 12 and 13 West, Section 1; (*S.B.B.M*).

Prepared for

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July 2012

TABLE OF CONTENTS

Section **Page**

TABLES

EXHIBITS

APPENDICES

NATIONAL ARCHAEOLOGICAL DATABASE (NADB) INFORMATION SHEET

PHASE I CULTURAL RESOURCES ASSESSMENT: BIG TUJUNGA RESERVOIR SEDIMENT REMOVAL PROJECT

by

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Attn: Ryan Butler

USGS ***Condor Peak*** 7.5 Minute Quadrangle in Township 2 and 3 North; Range 12 and 13 West, Section 1 (*S.B.B.M*).

BonTerra Consulting
Project Number: CoLADPW J167

Key Words: Big Tujunga Reservoir, USGS Condor Peak, Hansen's Lodge

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EXECUTIVE/MANAGEMENT SUMMARY

PURPOSE AND SCOPE

BonTerra Consulting undertook this project to assess the potential impacts to Cultural Resources that would result from the implementation of the Big Tujunga Reservoir Sediment Removal Project. This document has been prepared to satisfy the requirements of the California Environmental Quality Act (CEQA). The format of this report follows *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format* (Office of Historic Preservation 1990).

DATES OF INVESTIGATION

Patrick Maxon, RPA conducted a cultural resources literature review on October 6, 2011, at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton and BonTerra Consulting Archaeologist Albert Knight conducted a literature review at the United States Department of Agriculture Forest Service (Forest Service) offices in the City of Arcadia on October 13, 2011 (Appendix A). A paleontological review request was received from Samuel McLeod of the Natural History Museum of Los Angeles on October 27, 2011 (Appendix B). Native American consultation was initiated on September 26, 2011, with a letter to the Native American Heritage Commission (NAHC). Letters were sent to Native American tribes and individuals on September 27, 2011 (Appendix C). A cultural resources survey of the property was conducted by Albert Knight on October 13, 2011 (refer to United States Department of Agriculture Forest Service Permit #LAR904CRI in Appendix D). A historic photograph, a site photograph, and an aerial photograph are located in Appendix E. Mr. Maxon and Christopher Drover, Ph.D. prepared and completed this technical report in July 2012. Resumes of BonTerra Consulting staff are located in Appendix F.

FINDINGS OF THE INVESTIGATION

No significant cultural resources were discovered on the project site during the survey.

INVESTIGATION CONSTRAINTS

Dense vegetation and non-native grasses cover as much as 70 percent of the project area. Both native and non-native vegetation remains on site. The project site is developed with the dam and reservoir, access roads, and the debris previously placed in Maple Canyon Sediment Placement Site.

RECOMMENDATIONS

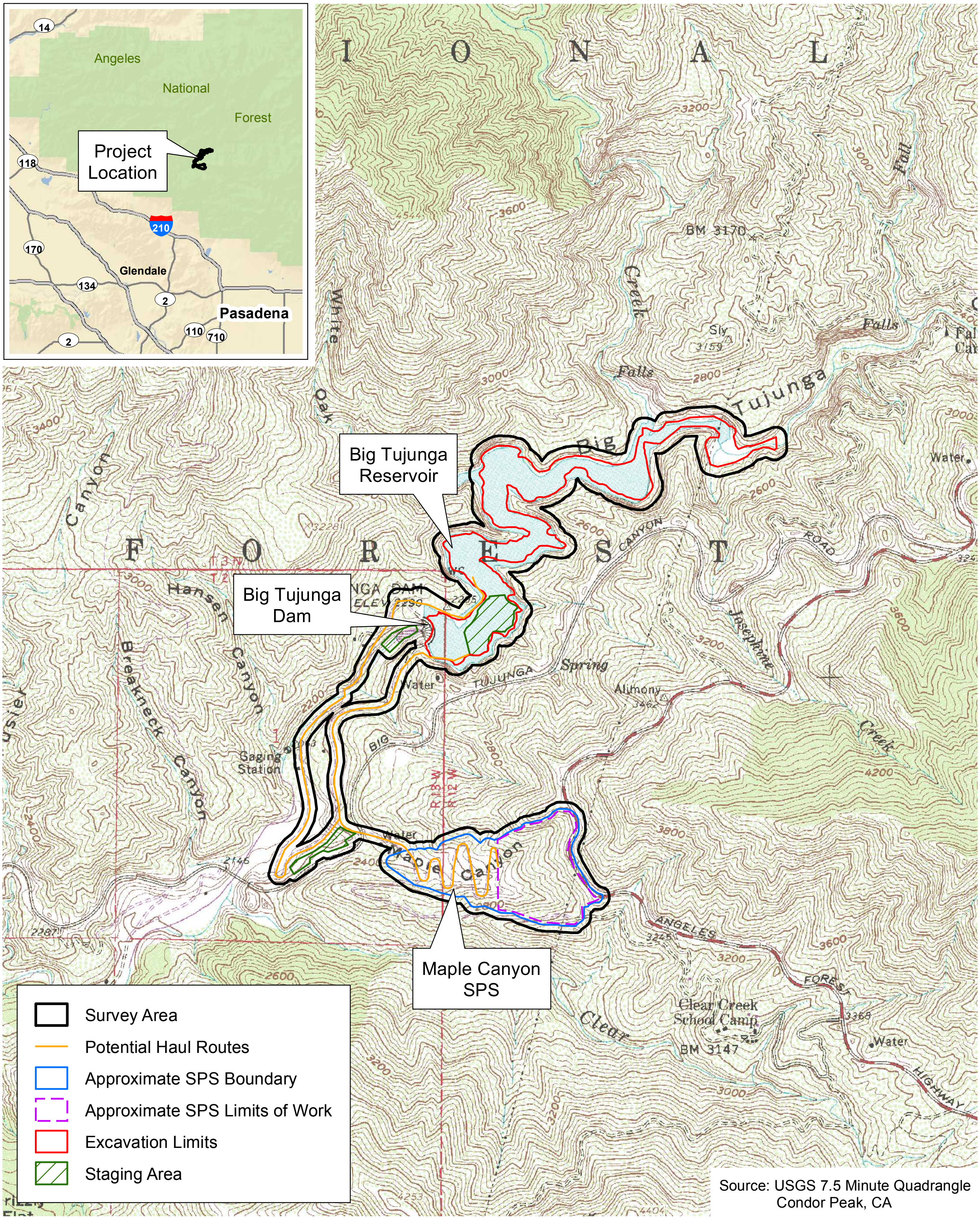
Prior to ground-disturbing activities on the project site, Mitigation Measure (MM) 1 requires that a qualified Archaeologist be retained in the event that cultural resources are discovered during grading activities. No further disturbance shall occur in the vicinity of the discovery until the Archaeologist examines and evaluates the discovery. It is not anticipated that regrading access roads for truck traffic will impact any native sediments, and therefore will not impact any possible remnants of Hansen's Lodge (Confidential Appendix G) or other cultural resources; however, some grading is anticipated in order to build a ramp into the reservoir to facilitate access by sediment removal equipment. Implementation of MM 1 would ensure that impacts are reduced to a less than significant level.

There is no indication as a result of this study that human remains are present within the project site. The records search and field survey indicate no evidence of human remains on or near the site. Project-related earth disturbance, however, has the potential to unearth previously undiscovered remains, resulting in a potentially significant impact. However, implementation of MM 2 would ensure that impacts are reduced to a less than significant level.

During the literature review conducted for the Project, it was noted that a short segment of the SCE Transmission Line Road (19-186877), was incorrectly recorded in the DPR forms. The road is recorded as being a series of switchbacks extending up Maple Canyon; however, the SCE Transmission Line Road actually extends up the canyon along its southern slope. Therefore, SCE Transmission Line Road would not be subject to the proposed sediment deposits. The proposed fill area at Maple Canyon would not come near nor include the access road and thus, the Project would not affect the road's historic significance, either directly or indirectly. If the County desires to correct the record and remove the incorrect designation from the Maple Canyon SPS access road, the County has the option of preparing a supplement to the existing site record on a DPR 523L Continuation sheet and depicted on an updated DPR 523J Location Map the correct location of the segment of the SCE Transmission Line Road.

DISPOSITION OF DATA

This report will be filed with the County of Los Angeles Department of Public Works; with BonTerra Consulting; with the United States Forest Service; and at the SCCIC. All field notes and other documentation related to the study are on file at BonTerra Consulting.



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Project Site

Exhibit 1

Big Tujunga Reservoir Sediment Removal Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

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1.0 UNDERTAKING INFORMATION/INTRODUCTION

1.1 CONTRACTING DATA

The County of Los Angeles Department of Public Works (LACDPW) retained BonTerra Consulting to conduct a Phase I Cultural Resources Study for the proposed Big Tujunga Reservoir Sediment Removal Project (Project). This report details the findings of the investigation and offers management recommendations and mitigation measures to reduce the impact of the project to a less than significant level. Survey activities were conducted under United States Department of Agriculture Forest Service Permit #LAR904CRI.

1.2 UNDERTAKING

The Big Tujunga Reservoir (BTR) is located in the San Gabriel Mountains within the Angeles National Forest, which is located within the unincorporated County of Los Angeles on land owned by the U.S. Forest Service. The BTR is located along Big Tujunga Canyon Road, approximately 4.5 miles north of La Crescenta-Montrose and approximately 7 miles northeast of the community of Sunland. Maple Canyon Sediment Placement Site (Maple Canyon SPS) is located approximately 1.8 miles south of BTR and just east of Big Tujunga Canyon Road.

The LACDPW proposes to conduct the Project, which involves the excavation of sediment within BTR and the deposition of the sediment in the Maple Canyon SPS. The Project consists of various activities, as described below.

Excavations of up to 4.4 million cubic yards (mcy) of sediment would be conducted over an area of approximately 83 acres within the BTR. The actual amount of sediment removal would depend on the amount of rainfall and sediment deposition on coming years. If 4.4 mcy of sediment is required to be removed from BTR, the remaining capacity of the Maple Canyon SPS would be eliminated. As sediment is deposited into Maple Canyon SPS, drainage facilities would be extended into new fill areas of the SPS, which would ultimately be revegetated in compliance with the Maple Canyon Debris Disposal Site Revegetation Plan.

Prior to beginning any sediment removal, portions of the existing access roads would be re-established to accommodate the proposed truck traffic. Portions of the access roads would require improvements, with approximately two miles of unpaved sections and three miles of paved sections. The access roads may need to be improved periodically throughout the entire Project schedule due to erosion or damage that may occur from storms and/or the Project. Behind the dam structure, an access road will be graded to allow trucks to access the lower portions of the reservoir as sediment is removed.

1.3 EXHIBIT

Exhibit 1 depicts the specific location of the project site on a portion of the U.S. Geological Survey (USGS) Condor Peak 7.5-minute quadrangle. It also identifies Maple Canyon SPS and potential sediment haul routes.

1.4 PROJECT PERSONNEL

Albert Knight completed the USFS cultural resources literature review and background research for the project and performed the cultural resources survey. Patrick Maxon, M.A., RPA completed a literature review at the SCCIC, and Mr. Maxon and Christopher Drover, Ph.D., RPA authored this report. Refer to Appendix F for staff qualifications.

2.0 REGULATORY SETTING

This section contains a discussion of the applicable laws, ordinances, regulations, and standards that govern cultural resources and must be adhered to both prior to and during project implementation. The report is intended to satisfy the requirements of the California Environmental Quality Act (CEQA) regulations (14 *California Code of Regulations* [CCR] §15064.5 and *California Public Resources Code* [PRC] §21083.2), as well as the requirements for a federal action under the National Environmental Policy Act (NEPA) and an analysis pursuant to Section 106 of the National Historic Preservation Act (16 *United States Code* [USC] 470f) and its implementing regulations listed in the *Code of Federal Regulations* (36 CFR, 800, Protection of Historic Properties).

2.1 FEDERAL

Cultural resources are considered during federal undertakings chiefly under Section 106 of National Historic Preservation Act (NHPA) of 1966 (as amended) through one of its implementing regulations (36 CFR 800, Protection of Historic Properties) and NEPA. Properties of traditional religious and cultural importance to Native Americans are considered under Section 101(d)(6)(A) of NHPA. Other federal laws include the Archaeological Data Preservation Act of 1974, the American Indian Religious Freedom Act (AIRFA) of 1978, the Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act of 1989, among others.

Section 106 of NHPA (16 USC 470f) requires federal agencies to take into account the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP) and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings (36 CFR 800.1). Under Section 106, the significance of any adversely affected cultural resource is assessed, and mitigation measures are proposed to reduce the impacts to an acceptable level. Significant cultural resources are those resources that are listed or are eligible for listing in the NRHP per the criteria listed at 36 CFR 60.4 below:

> The quality of significance in American history, architecture, archaeology, engineering and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling and association and that:
>
> (a) Are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) Are associated with the lives of persons significant in our past; or
>
> (c) Embody the distinctive characteristics of a type, period, or method of installation, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) Have yielded, or may be likely to yield, information important in prehistory or history.

2.2 CEQA

CEQA requires a lead agency to determine whether a project would have a significant effect on one or more historical resources. According to Section 15064.5(a) of the State CEQA Guidelines, a "historical resource" is defined as a resource listed in or determined to be eligible for listing in the California Register of Historical Resources (CRHR) (PRC §21084.1); a resource included in a local register of historical resources (14 *California Code of Regulations* [CCR], Section 15064.5[a][2]); or any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant (14 CCR 15064.5[a][3]).

Section 5024.1 of the PRC, Section 15064.5 of the State CEQA Guidelines (14 CCR), and Sections 21083.2 and 21084.1 of the CEQA Statutes were used as the basic guidelines for the cultural resources study. PRC 5024.1 requires evaluation of historical resources to determine their eligibility for listing on the CRHR. The purposes of the CRHR are to maintain listings of the State's historical resources and to indicate which properties are to be protected from substantial adverse change. The criteria for listing resources in the CRHR, which were expressly developed to be in accordance with previously established criteria developed for listing in the NRHP (per the criteria listed at 36 CFR 60.4) are stated below.

> The quality of significance in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California is present in any object, building, structure, site, area, place, record, or manuscript that possesses integrity of location, design, setting, materials, workmanship, feeling and association and that:
>
> (a) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage; or
>
> (b) Is associated with the lives of persons important in our past; or
>
> (c) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
>
> (d) Has yielded, or may be likely to yield, information important in prehistory or history.

According to Section 15064.5(a)(3)(A–D) of the State CEQA Guidelines (14 CCR), a resource is considered historically significant if it meets the criteria for listing in the NRHP (per the criteria listed at 36 CFR 60.4). Impacts that affect those characteristics of the resource that qualify it for the NRHP or that would adversely alter the significance of a resource listed in or eligible for listing in the CRHR are considered to have a significant effect on the environment. Impacts to cultural resources from the proposed project are thus considered significant if the project (1) physically destroys or damages all or part of a resource; (2) changes the character of the use of the resource or physical feature within the setting of the resource that contributes to its significance; or (3) introduces visual, atmospheric, or audible elements that diminish the integrity of significant features of the resource.

The purpose of a cultural resources investigation is to evaluate whether any cultural resources remain exposed on the surface of the project site or whether any cultural resources can reasonably be expected to exist in the subsurface. If resources are discovered, management recommendations would be required for evaluation of the resources for NRHP or CRHR eligibility.

Broad mitigation guidelines for treating historical resources are codified in Section 15126.4(b) of the CEQA Guidelines. To the extent feasible, public agencies should seek to avoid significant effects to historical resources, with preservation in place being the preferred alternative. If not feasible, a data recovery plan shall be prepared to guide subsequent excavation. Mitigation for historical resources such as buildings, bridges, and other structures that are consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties (Weeks and Grimmer 1995) will generally be considered mitigated below a level of significance.

2.3 SENATE BILL 18

Senate Bill (SB) 18 (*California Government Code* §65352.3) incorporates the protection of California traditional tribal cultural places into land use planning for cities, counties, and agencies by establishing responsibilities for local governments to contact, refer plans to, and consult with California Native American tribes as part of the adoption or amendment of any general or specific plan proposed on or after March 1, 2005. There is no general or specific plan amendment or adoption required for this project; therefore, formal consultation under SB 18 is not necessary; however, informal scoping was undertaken with local tribes through notification via informational letter.

2.4 HUMAN REMAINS

Section 7050.5 of the *California Health and Safety Code* provides for the disposition of accidentally discovered human remains. Section 7050.5 states that, if human remains are found, no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined the appropriate treatment and disposition of the human remains.

Section 5097.98 of the PRC states that, if remains are determined by the Coroner to be of Native American origin, the Coroner must notify the NAHC within 24 hours which, in turn, must identify the person or persons it believes to be the most likely descended from the deceased Native American. The descendents shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the property owner, the disposition of the human remains.

3.0 SETTING

3.1 NATURAL

The area surrounding BTR is undeveloped and comprised of natural vegetation types, including several chaparral sub-types (e.g., chamise chaparral, scrub oak chaparral, and mixed chaparral). Much of the area surrounding BTR was burned in the 2009 Station Fire but is now recovering. Chamise chaparral, mixed chaparral, willow riparian forest, coast live oak stands, disturbed freshwater seep, and ornamental plantings are found along existing roads that would be used to haul material from BTR to Maple Canyon SPS. Scrub oak chaparral, chamise chaparral, California annual grassland, and unvegetated cliff faces are found within Maple Canyon SPS. Tributaries at the upper end of the Maple Canyon SPS contain small areas of burned riparian herb, sycamore woodland, and willow riparian scrub; however, these areas are beginning to resprout (BonTerra Consulting 2011). None of this vegetation would be disturbed as a part of the proposed project.

Steep vertical walls border the majority of the reservoir to the top of the 100 percent contour (i.e. the reservoir's sediment capacity elevation contour), which is surrounded by mountains. The topography steeply slopes down into the canyon; elevations range from approximately 2,150 to 3,400 feet above mean sea level (msl).

3.2 CULTURAL

3.2.1 Prehistoric

The prehistory of coastal Southern California has been described by a number of authors who generally agree on at least four major prehistoric periods (Wallace 1955; Warren 1968; Koerper and Drover 1983). These four sequential periods of time, sometimes called Horizons and sometimes Traditions, are each characterized by time-sensitive artifacts. The periods then are not arbitrary, but likely reflect material/cultural changes at those times.

The earliest occupations of the Southern California coast are debated to begin as early as 50,000 years before present, or "B.P." (Bada et al. 1974).[1] The earliest radiocarbon dates, however, were derived from Los Angeles Man and Laguna Woman at 23,600 and 17,150 B.P. respectively (Berger et al. 1971). Unfortunately, little is known of the material culture of finds of this antiquity. The earliest archaeological culture known in any detail is that of San Dieguito, named after the drainage of the same name near Del Mar, California where implements dating to 8,000 B.P. were found. Although the subsistence strategy of this tradition is unknown, Warren (1968:2) has inferred a hunting economy (cf. Koerper and Drover 1983; Drover et al. 1983). Typical artifacts would include percussion flaked implements, elongated knives, domed scrapers, teshoa flakes, crescentics and an absence of millingstone tools. The San Dieguito culture is defined primarily from its single type site, the Harris Site of San Diego County, CA-SDi-149 (Warren 1966).

After San Dieguito, the next prehistoric period for coastal Southern California is termed "Millingstone" and "Encinitas" by Wallace (1955) and Warren (1968), respectively. The Millingstone Horizon or Encinitas Tradition are very similar as described by each author and have a time span beginning about 7,000 to 8,000 B.P. and ending between 3,000 to 4,000 B.P. The onset of Holocene climatic conditions may have brought about the cultural changes associated with this period. Processing tools like manos and metates (millingstone) reflect an increased dependence on plant foods. Projectiles are rare, but, when found, suggest the use of

[1] "Before Present" assumes that 1950 is "present".

the atlatl or throwing stick. The material culture characteristic of this period is longer-lived the further one travels south of Santa Barbara.

The third period following Encinitas, or Millingstone, is known as the "Intermediate Horizon" and "Campbell Tradition" by Wallace (1955) and Warren (1968), respectively. This period is strongly represented north of the Los Angeles area and is only suggested in the San Diego area. Numerous, smaller projectile points suggesting increased hunting and the introduction of the use of the bow and arrow characterize this period. It is during the Intermediate Horizon, or Campbell Tradition that true maritime exploitation and occupation of the Channel Islands flourishes (Meighan 1959). The duration of this period is roughly 3,000 to 1,000 B.P. In general, the emphasis seems to shift from the hard seed orientation of the Milling Stone Tradition to the growing practice of balanophagy (acorn consumption) and processing of other soft, pulpy seeds. While mortars and pestles become more common in comparison to manos and metates, the latter survive into European contact times attesting to the use of hard seeds in the diet.

In the southern end of Los Angeles County, several traits make an appearance rather late in the Tradition; these include pottery and ground painting, which give rise to speculation that significant culture contact from the southeast was occurring (Meighan 1954). This complex is thought to owe its basic cultural orientations to the Southwestern United States.

A general picture emerges through time of growing population pressure resulting in intensified land use patterns. Increases in population or siltation of coastal estuaries are examples of intensifying the local carrying capacity (e.g., Newport Bay during the Milling Stone Tradition). Occasionally, siltation may actually progress to the point of making an estuary less productive as in the case of northern Orange County (Newport Back Bay) resulting in local populations adapting to other environments such as acorn processing.

Table 1 depicts an overview of Southern California Prehistory in relation to North America.

TABLE 1
SOUTHERN CALIFORNIA PREHISTORY

<table>
<tr><th>Time BP</th><th>Newport Coast</th><th>Los Angeles</th><th colspan="2">San Diego</th><th colspan="2">Deserts</th><th>North America</th><th></th></tr>
<tr><td></td><td>Peterson et al. 1991</td><td>Wallace 1955</td><td>Warren 1968</td><td>Moriarty 1966</td><td>M. Rogers 1966</td><td>Wallace 1962</td><td>Willey + Phillips 1955</td><td>Climate</td></tr>
<tr><td></td><td>LP 2</td><td>Historic</td><td rowspan="2">Yuman-Shoshonean</td><td>Diegueno II</td><td>Dieguero-Luiseno</td><td rowspan="2">Prehistoric Yuman-Shoshonean</td><td>Post Classic</td><td rowspan="5">Medithermal</td></tr>
<tr><td>1,000</td><td rowspan="2">LP 1</td><td>Horizon IV-Late Prehistoric</td><td rowspan="5">Dieguero I</td><td rowspan="2">Prehistoric Yuman-Shoshonean</td><td>Classic-Urban</td></tr>
<tr><td></td><td rowspan="4">Horizon III-Intermediate</td><td rowspan="6"></td><td rowspan="2">Amargosa</td><td rowspan="4">Formative-food production</td></tr>
<tr><td>2,000</td><td rowspan="3">Intermediate Period</td><td rowspan="15">La Jollan-Amargosa II</td></tr>
<tr><td></td><td rowspan="6">Pinto</td></tr>
<tr><td>3,000</td><td rowspan="6">Little Pluvial</td></tr>
<tr><td></td><td rowspan="3">MS 3</td><td rowspan="5">Horizon II-Millingstone</td><td>La Jolla III</td><td rowspan="8">Archaic-broad-based hunting, collecting-emphasis on plant foods</td></tr>
<tr><td>4,000</td><td rowspan="7">La Jolla II</td></tr>
<tr><td></td><td rowspan="6">Campbell</td></tr>
<tr><td>5,000</td><td rowspan="3">MS 2</td></tr>
<tr><td></td><td rowspan="4">Haitus</td></tr>
<tr><td>6,000</td><td rowspan="9">Horizon I-Early Man</td><td rowspan="6">Altithermal</td></tr>
<tr><td></td><td rowspan="6">MS 1</td></tr>
<tr><td>7,000</td></tr>
<tr><td></td><td rowspan="4">Encinitas</td><td rowspan="4">La Jolla</td><td rowspan="6">Lake Mojave</td><td rowspan="6">Lithic-hunting, collecting-emphasis on hunting(?)</td></tr>
<tr><td>8,000</td></tr>
<tr><td></td><td rowspan="3">Anathermal</td></tr>
<tr><td>9,000</td></tr>
<tr><td></td><td rowspan="2">Paleo-Coastal</td><td rowspan="2">San Dieguito</td><td rowspan="2">San Dieguito</td><td>Haitus</td></tr>
<tr><td>10,000</td><td>San Dieguito III</td></tr>
<tr><td colspan="9">LP: Late Prehistoric; MS: Millingstone
Source: Christopher Drover 2012</td></tr>
</table>

3.2.2 <u>Ethnographic</u>

Gabrielino

While of limited use to much of prehistory, data acquired in contact times is somewhat useful as an analogy to the Late Prehistoric Period. At the time of contact in 1769, the Gabrielino Native Americans occupied the area around the project site. The Spanish named the Gabrielino after the Mission San Gabriel Archangel. The Gabrielino spoke Takic (Shoshonean) languages.

<u>Settlement</u>

According to Bean and Smith (1978:538), the Gabrielino is, in many ways, one of the least known groups of California's native inhabitants. In addition to much of the Los Angeles Basin, they occupied the offshore islands of Santa Catalina, San Nicolas, and San Clemente. Gabrielino populations are difficult to reconstruct. However, at any one time, as many as 50 to 100 villages were simultaneously occupied. Like the prehistoric culture before them, the Gabrielino were a hunter/gatherer group who lived in small sedentary or semi-sedentary groups of 50 to 100 persons, termed rancherias. These rancherias were occupied by at least some of the people all of the time. Location of the encampment was determined by water availability. Houses were circular in form and constructed of sticks covered with thatch or mats. Each village had a sweat lodge as well as a sacred enclosure (Bean and Smith 1978). Although the earliest description of the Gabrielino dates back to the Cabrillo expedition of 1542, the most important and extensive accounts were those written by Father Geronimo Boscana about 1822 and Hugo Reid in 1852.

Subsistence

Gabrielino subsistence relied heavily on plant foods, but was supplemented with a variety of meat, especially from marine resources. Food procurement consisted of hunting and fishing by men and gathering of plant foods and shellfish by women. Hunting technology included use of bow and arrow for deer and smaller game, throwing sticks, snares, traps, and slings. Fishing was conducted with the use of shell fishhooks, bone harpoons, and nets. Seeds were gathered with beaters and baskets. Seeds and other foods were stored in baskets. Seeds were prepared with manos and metates and/or mortars and pestles. Food was cooked in baskets coated with asphaltum, in stone pots, on steatite frying pans, and by roasting in earthen ovens (Bean and Smith 1978).

Trade

Most trade between settlements was through reciprocity (barter), indicated by strings of Olivella shell beads used as a medium of exchange throughout Southern California (Ruby 1970). Gabrielino and Juaneño from the mainland probably traded trade beads, game, and plant foods in exchange for shell beads and steatite, and plant foods from the islanders. Steatite artifacts along with fish, shell money, and animal pelts were traded by the mainlander Gabrielino into the interior for seeds and deer skin. According to Bean (1972), the Gabrielino traded with the Serrano and the Cahuilla to the east. The Gabrielino traded goods such as shell beads, dried fish, sea otter pelts, asphaltum, and steatite for goods such as salt, obsidian, deer hides, furs, and acorns. There is evidence of trade between the Arizona Hohokam and the Gabrielino, probably with the Mojave people as middleman (Koerper in Mason 1997 et al.). *Glycymeri*s shell bracelets, ceramics, and blankets may have been exchanged for Pacific shells and shell beads (Koerper in Mason 1997).

Religion

Aside from shamanistic curing rituals, principal religious activity is related to the Chinigchinich cult that emphasized correct behavior as promulgated by a mythical figure, Chinigchinich. The Chinigchinich religion developed in Gabrielino territory and spread southeast to the Juaneño/Luiseño, Cupeño, and Ipai. It is a cult that is tied into an older creation myth. Chinigchinich is said to give laws and punishment for those who are disobedient in which shamans were given responsibilities to oversee the cult. It was an extensive system of polar opposites (duality) that are united under higher principals (unity) (Applegate 1979). Male-Female dualism found in the creation myth is also present in the origin myth (Applegate 1979). Chinigchinich cult ceremonies included boys' puberty ceremonies using *toloache,* a drug made from Jimson Weed (*Datura stramonium*). During the vision quest, a personal protector or totemic animal was acquired. Such totems could be bear, coyote, crow, or rattlesnake. Other ceremonies were to obtain vengeance on enemies, to express thanks for victory, and to commemorate the dead. The focus of the ceremonies was a circular sacred enclosure found in each village. The emphasis on male rites of passage and war may be a response to the increasing population and resultant competition for territory and access to resources. Or it may be a response to the arrival of the Spanish since the Chinigchinich religion seems to be of recent (not prehistoric) origin.

Both inhumation (burial in a grave) and cremation was practiced. During cremations, the goods of the deceased and his hut were often buried with him. Annual mourning ceremonies were held in the late summer for all who had died during the previous year. Clothes of the deceased and an image of the deceased were often burned at this time. Eagles were sacrificed for recently deceased chiefs (Applegate 1979).

3.2.3 Local History

In the 1770s, the California Mission systems were founded by Junipero Serra, who established a series of missions northward from San Diego to San Francisco, one day's horse ride apart. Mission names were often adopted to refer to Native American groups (such as "Gabrielino" derived from Mission San Gabriel). The missions controlled large areas of land until 1824, when the Mexican government declared its independence from Spain. The majority of mission lands were then secularized and distributed by land grants to specific individuals. As stated by Yamada (2011):

> One of the earliest land grants was awarded to Jose Maria Verdugo a native of Loreto, in Baja California, was serving as a military guard at the mission at San Gabriel. In 1784 he received one of the first land grants made in Alta California by the King of Spain and one of the largest ever issued during the Spanish occupation. That land now incorporates a good part of present day Glendale, Burbank, Eagle Rock, Highland Park, the west part of Pasadena and the area in the triangle formed by the junction of the Arroyo Seco and the Los Angeles River, according to Carroll W. Parcher in his chronicle, Glendale Community Book.

The general project area is within the region historically occupied by Gabrielino Indians, likely the group known as Fernandeno (Bean and Smith 1978) or the Tongva. The unpublished notes of J.P. Harrington indicate the name *Maqunga* as the name for Big Tujunga Canyon (Singer 1985). Most of the Gabrielino villages were abandoned around 1805 due to rapid decline from European-introduced diseases (Singer 1985). Baptismal records from Mission San Fernando and Mission San Gabriel indicate that the population of the village of Tujunga at the mouth of the canyon had a population of 92 people baptised between 1783 and 1811 (Merriam 1968:102, 120; Singer 1985).

The 20th Century development in the area included commerce, mining, and residential development often spurned by individuals seeking good health suffering from respiratory illnesses. Many health sanitoria dotted the area, which eventually attracted Dr. Homer Hansen, a prominent individual who came to develop land within the project area (Hitt 2002:24).

4.0 METHODS

4.1 CULTURAL RESOURCES RECORDS SEARCH

A literature review of documents on file at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton was completed by Patrick Maxon on October 6, 2011, and Albert Knight completed a second records search at the U.S. Forest Service offices in Arcadia on October 13, 2011 (Appendix A). The review consisted of an examination of the U.S. Geological Survey's (USGS) Condor Peak, California 7.5-minute quadrangle to evaluate the project area for any sites recorded or cultural resources studies conducted on the parcel and within a one-mile radius. The SCCIC is the designated branch of the California Historical Resources Information System (CHRIS) and houses records concerning archaeological and historic resources in Los Angeles, Orange, and Ventura Counties. The records search provided data on known archaeological and built environment resources as well as previous studies within one mile of the project site. Data sources consulted at the SCCIC included archaeological records, Archaeological Determinations of Eligibility (DOE), historic maps, and the Historic Property Data File (HPDF) maintained by the California Office of Historic Preservation (OHP). The HPDF contains listings for the CRHR and/or NRHP, California Historical Landmarks (CHL), and California Points of Historical Interest (CPHI).

4.2 PALEONTOLOGICAL RESOURCES RECORDS SEARCH

A paleontological records search for the Project was requested on October 3, 2011, from the Natural History Museum of Los Angeles County. A response was received on October 28, 2011, by Samuel McLeod, Vertebrate Paleontologist (see Appendix B).

4.3 NATIVE AMERICAN SCOPING

An inquiry was made of the NAHC located in Sacramento to request a review of the Sacred Lands File database regarding the possibility of Native American cultural resources and/or sacred places in the project vicinity that are not documented on other databases. The NAHC also provided a list of Native American groups and individuals who may have knowledge regarding Native American cultural resources not formally listed on any database. Each of these groups and individuals were mailed an informational letter September 27, 2011, describing the project and requesting any information regarding resources that may exist on or near the project site. Information regarding the results of the Native American coordination/consultation is provided in Appendix C.

4.4 ARCHAEOLOGICAL FIELD SURVEY

A systematic archaeological survey of the project site was conducted by BonTerra Consulting Archaeologist Albert Knight under the supervision of Patrick Maxon, RPA on October 13, 2011. The entirety of the project site was surveyed via parallel transects spaced approximately five meters apart where possible and included focused surveys in areas of concentrated cultural material. Dense, low-growing grasses and disturbed soils debilitated ground survey efforts.

5.0 RESULTS

5.1 CULTURAL RESOURCES RECORDS SEARCH

Sixteen archaeological surveys have been conducted within a one-mile radius of the project site. Five of the surveys included at least a portion of the project site. Ten previously recorded resources are located within one mile of the project site. Two recorded resources are located on the project site (19-186860 and 19-186877), and a third (Hansen's Lodge) is believed to be located there.

Table 2 identifies the previous cultural resources studies that include at least a portion of the project site.

TABLE 2
CULTURAL RESOURCES STUDIES WITHIN ONE MILE OF THE PROJECT SITE

Report Number	Author(s) (Year)	Type of Study/Comments
LA1477	Clay Singer (1985)	Survey and Impact Assessment for the Proposed Maple Canyon Relief Drain.
LA3053	LSA Associates (1994)	Cultural Assessment of Angeles Forest Highway at Mile Marker 23.00.
LA7155	Bartoy (2003)	Survey for Los Angeles County Flood Control Tanks.
LA9746	Schmidt and Schmidt (2003)	Phase I Investigation; Southern California Edison, Verdugo Distribution Line Circuit. Recordation of sites 186860+186877.
LA10175	Applied Earthworks	Cultural Resources Report for the Tehachapi Transmission Project. 22 different USGS quadrangles.
USGS: U.S. Geological Survey		

Table 3 describes the known cultural resources within one mile of the project site.Three cultural resources noted in Table 3 are within the area of potential effects (APE) of the proposed sediment removal project: 19-186860, 19-186877, and the former location of the Hansen Lodge.

TABLE 3
CULTURAL RESOURCES ON OR WITHIN ONE MILE OF THE PROJECT SITE

Site Number	Recorder/(Year)	Comment	Resource Within APE
19-003104	Cotterman, Peterson and Sander/ (2003)	4 structural foundations	No
19-003471	Panlagua/ (2003)	6 structural features (possibly early Clear Creek School Camp facilities)	No
19-003386	Brasket and Wallace/ (2004)	Concrete structural foundation	No
19-003986	Lichtenstein/ (2009)	Various cement slab features; former scenic overlook	No
19-100796	Norton/ (2009)	Plumb Bolo knife	No
19-186535	Arbuckle/ (1979)	The Angeles National Forest	No
19-186860	Schmidt (2003)	Wooden power poles/insulators	Yes
19-186877	Schmidt and Schmidt (2003)	26 miles of USFS road alignment; shown on USGS 1926 and 1931 maps	Yes
19-186923	Vance/ (2001)	Mt. Lukens Road (2N76)	No
19-187713	Sander (2003)	Angeles Forest Highway; 25 mile alignment; Mill Creek Bridge built between 1939 and 1941; tunnel 1941	No
	Knight and Maxon (2011)	Extrapolated location of Hansen's Lodge (USFS)	Yes
USFS: U.S. Forest Service			

5.1.1 Resources Within the Area of Potential Effect

19-186860

This site is Southern California Edison's (SCE's) Verdugo Circuit. It is a linear arrangement of poles, the extreme eastern end of which extends over the access road west of the reservoir where it splits. The northern fork terminates a short distance to the east, still south of the reservoir; the south fork extends through Maple Canyon, where it terminates near the top. Much of this was destroyed during the 2009 Station Fire, but was rebuilt.

19-186877

This site consists of a 26-mile-long alignment that includes parts of five Forest- and/or SCE-maintained roads (Schmidt and Schmidt 2003). The site includes all or part of Forest Roads 4N24, 3N27, 2N74, 2N75 and 2N77, as shown both on the 1926 and 1931 depictions of the Angeles National Forest (USDAFS 1926, 1931), and on the 1936 USGS Mt Lowe 6-minute quadrangle (Schmidt and Schmidt 2003). Schmidt and Schmidt (2003) quote Robinson (1991) who describes the road as the first road "all the way across the backbone of the San Gabriels". The SCE pole line road was designed to service the high voltage transmission line between the community of Vincent, on the north side of the mountains, and Eagle Rock on the south side (Schmidt and Schmidt 2003). The proposed fill planned for Maple Canyon would not alter this site's significance because the alignment in the Canyon has already been altered. The existing recordation of the site, the linear nature of the resource, and its continued function do not damage the resource or require determination of eligibility.

Hansen's Lodge

While the structures no longer visibly exist, a private residence and Hansen's Lodge was built within the project site boundaries by Dr. Homer Hansen. Dr. Hansen originally visited Big Tujunga as a teenager in 1892 and returned as a young physician a few years later, enjoying camping spots amongst the trees in the local canyon terrain. In the early 1900s, Hansen was forced to retire to the canyon upon a diagnosis of acute inflammatory rheumatism (Vargo 2011).

Dr. Hansen found the sunshine and mountain environment therapeutic, and recovered by 1909. He filed claim for 93 acres at just below the present Big Tujunga Dam. Within a year he built a small cabin, and then built Hansen's Lodge, which grew to be a popular spot with politicians and celebrities from Southern California (Vargo 2011). The lodge had guest accommodations, stables, and a swimming pool. The flood of 1926 destroyed Hansen's Lodge, but he rebuilt it, only to have it destroyed again in 1938 by one of the biggest floods to hit the area. All but stone fireplaces were destroyed so the structure was not rebuilt (Vargo 2011). The Forest Service believes that the site of Hansen's Lodge (FS# 05015500017) was somewhere on the lower (now paved) part of the Dam access road, close by the drainage (and just southeast of Gauging Station 2063) in the vicinity of UTM 11:3794522N; 390151E. Remnants of the lodge are said to have been knocked down years ago to deter weekend partygoers. Confidential Appendix G depicts the approximate location of the Lodge.

5.2 PALEONTOLOGICAL RESOURCES

A paleontological records search for the proposed project was requested on October 3, 2011, from the Natural History Museum of Los Angeles County. A response was received on October 28, 2011, by Samuel McLeod, Vertebrate Paleontologist (see Appendix B). McLeod's response suggests that excavations in the igneous bedrock, which occurs throughout most of the project site, as well as shallow excavations in Quaternary sedimentary deposits (gravel) in the southwestern portion of the project site, near the access roads, probably would not uncover significant vertebrate fossils. He further mentioned that only deep excavation in the southwestern portion of the project site may encounter significant fossil remains. Only excavations of substantial depth might require paleontological monitoring.

5.3 NATIVE AMERICAN SACRED LANDS FILE REVIEW

The NAHC Search of the Sacred Lands File on September 26, 2011, did not identify the presence of Native American cultural resources on the project site. In addition, the NAHC provided a list of Native American groups and individuals that may have knowledge of the religious and/or cultural significance of resources that may be in and near the project site. The NAHC listed the following groups and individuals:

- Charles Cooke
- Beverly Salazar Folkes
- Randy Guzman-Folkes
- Ronnie Salas
- Ron Andrade
- John Valenzuela
- Delia Dominguez

Each of these groups and individuals were mailed an informational letter on September 27, 2011, describing the project and requesting any information regarding resources that may exist on or near the project site. No responses have been received to date from the tribes and individuals contacted.

On June 21, 2012, follow-up telephone calls were made to ensure a reasonable and good faith effort to contact all tribes and individuals that were sent letters and failed to respond. Table 4 below summarizes the results of consultation, and all Native American correspondence can be viewed in Appendix C.

TABLE 4
NATIVE AMERICAN CONSULTATION SUMMARY

Date Sent	Native American Contact	Date of Follow-Up Phone Call	Comments
9/26/11	Charles Cook	6/21/12	Mr. Cooke stated that the project site is located in a sensitive area and that a Cultural Resources Monitor should be present on site.
9/26/11	Beverly Salazar Folkes	6/21/12	Ms. Salazar stated that, because the site is located within a sensitive area, a Native American Monitor should be present or on call.
9/26/11	Randy Guzman Folkes	6/21/12	Mr. Guzman-Folkes stated in an email that he believes Cultural Resources Monitoring is required for the Big Tujunga Sediment Removal Project.
9/26/11	Ronnie Salas	6/21/12	Rudy Ortega, responding for Mr. Salas, requested a copy of the original letter via email. The letter was emailed to Mr. Ortega.
9/26/11	Ron Andrade	6/21/12	Left voicemail. No response was received.
9/26/11	John Valenzuela	6/21/12	Mr. Valenzuela had no comments. He recommended that we contact Ann Brierty with the San Manuel Band of Mission Indians regarding the proposed project. Ms. Brierty does not appear on the NAHC contact list.
9/26/11	Delia Dominguez	6/21/12	Left voicemail. No response was received.
NAHC: Native American Heritage Commission.			

5.4 ARCHAEOLOGICAL FIELD SURVEY

On October 13, 2011, BonTerra Consulting Archaeologist Albert Knight conducted a pedestrian survey of the project site. The survey area can be described as three distinct areas: Upstream/Reservoir-side of the Dam; downstream side of the Dam; and Maple Canyon. The photograph below, taken from the northeast and looking southwest, depicts the upstream side of the reservoir.

Big Tujunga Reservoir - View from northeast

5.4.1 Upstream/Reservoir-Side of the Dam

This area could not be directly accessed, but a large part of it (mainly on the northwest side of the canyon) could be clearly seen from various vantage points just northwest of Big Tujunga Canyon Road. The upstream/reservoir-side of the Dam consists of a very narrow and steep gorge that is blocked by Big Tujunga Dam. The only exception is a small level area just north of the northern end of the Dam, which is well above the bottom of the canyon. This area was undoubtedly used as a staging/work area when the Dam was constructed. The reservoir is currently almost empty and it was quite easy to see into the basin/canyon that forms the reservoir. The sides of the basin/canyon are very steep, often to vertical. This is true from the Dam all the way upstream to the head of the canyon, well above the reservoir proper. With the exception of the small area near the Dam, there are no stream-side terraces or any other places where any archaeology sites, either prehistoric or historic, might be located. The material visible in the bottom of the canyon is mud, rock, and plant debris, much of which is burnt.

5.4.2 Downstream Side of the Dam

The downstream side of the dam could not be directly accessed, but all but the northernmost end could be clearly seen from various vantage points just north of Big Tujunga Canyon Road, especially from the concrete arch bridge just downstream from the Dam. The down-stream area is a continuation of the narrow and steep canyon above the Dam, although the canyon does widen out a small amount. The main drainage and the west side of the drainage are covered with natural riparian vegetation. The east side of the drainage is an embankment that is completely covered in cemented riprap to about 20 feet wide parallel to the drainage. A paved access road is immediately east of the riprap; both the road and riprap follow the drainage down-canyon from the north side of the dam to just above (north of) the arch bridge that carries

Big Tujunga Canyon Road across the canyon (near contour level 2146). The hillside above (generally east) this paved road has been contoured for stability and drainage control, and much of the trace of the access road above the drainage between where the (paved) road leaves the canyon bottom and where it becomes part of the main Dam facilities (i.e., about where Maple Canyon joins Big Tujunga Canyon) has been destroyed or obscured by grading and vegetation. The section of road from the entrance of the facilities northeast to the south (or southeast) side of the dam could not be accessed. The part of this section of road that can be seen from the entrance is paved, and it may be paved all the way to the Dam.

The Forest Service believes that the site of Hansen's Lodge (FS# 05015500017) was somewhere on the lower (now paved) part of the Dam access road, close by the drainage (and just southeast of Gauging Station 2063) near UTM 11:3794522N; 390151E. This part of the access road is paved and has cemented riprap between it and the active part of the drainage; any traces of the lodge, if such still exist, may be buried and not visible. This location, however, seems to be very close to the drainage. It is possible that the lodge was actually slightly higher on the hillside above the river (although the lodge is known to have been flooded at least once). The Hansen family is considered to be locally historically important. Hansen Dam, down-stream several miles, was named for the patriarch Dr. Homer Hansen, and is considered to be eligible for the NRHP. The areas where Big Tujunga Dam and its facilities are located were also once owned by the Hansen family, and a small canyon on the northwest side of the reservoir is still known as "Hansen Canyon". No professional researchers have ever examined the site (which has never been recorded) where the lodge was located (see Confidential Appendix G); however, the current project is not anticipated to impact this resource should it still exist in this location.

5.4.3 Maple Canyon

This area, as shown in the following two photographs, was easily accessed on foot via a paved access road. One of two water tanks (shown on the topographic map just above contour "2400") has the words "Maple Canyon" painted on it. The entrance to the canyon is directly east of and across the road from the entrance to the Dam complex. The bottom of the canyon and the hillsides in the lower parts of Maple Canyon above (i.e., east of) Big Tujunga Canyon Road for 100–150 meters remain natural although the vegetation was burnt in the Station Fire. There are no stream-side terraces or other places where an archaeological site might be located in this part of the canyon. Beyond (east of) this, the canyon has been filled with many tons of soil and rock deposited from earlier clearing of debris out of the Dam basin.

Maple Canyon Sediment Placement Site – View from the Northwest

Maple Canyon Sediment Placement Site – View from On Site

5.4.4 Summary

As a result of the analysis of the SCCIC records search and evidence gathered in the field, it became evident that a short segment of resource P-19-186877 (the SCE Edison Transmission Line Road) was incorrectly recorded. As it extends through Maple Canyon, the road is recorded as a series of switchbacks extending up the slope of the canyon on top of the previously placed sediment from earlier clean-outs of the reservoir. In reality, the transmission line road extends up the canyon along its southern slope and not up the existing fill. It is recommended that this error be corrected in a supplement to the existing site record on a DPR 523L Continuation sheet, and depicted on an updated DPR 523J Location Map, and submitted to the EIC.

6.0 CEQA IMPACT ANALYSIS

This impact analysis is provided to assist in the preparation of an environmental document for the proposed project and provides discussion regarding each significance criterion for cultural resources.

6.1 SIGNIFICANCE CRITERIA

Appendix G of the State CEQA Guidelines contains the Initial Study Environmental Checklist form, which includes questions relating to cultural resources. The issues presented in the Initial Study Checklist have been used as significance criteria. Accordingly, a project may result in a significant environmental impact if:

- *The Project would cause a substantial adverse change in the significance of a historical resource as defined in §15064.5.*
- *The Project would cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5.*
- *The Project would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.*
- *The Project would disturb any human remains, including those interred outside of formal cemeteries.*

6.2 PROJECT IMPACT ANALYSIS

Would the project cause a substantial adverse change in the significance of a historical resource?

During the literature review conducted for the Project, it was noted that a short segment of the SCE Transmission Line Road (19-186877), was incorrectly recorded in the DPR forms. The road is recorded as being a series of switchbacks extending up Maple Canyon; however, the SCE Transmission Line Road actually extends up the canyon along its southern slope. Therefore, SCE Transmission Line Road, would not be subject to the proposed sediment deposits. The proposed fill area at Maple Canyon would not come near nor include the access road and thus, the Project would not affect the road’s historic significance, either directly or indirectly, and no mitigation is required. If the County desires to correct the record and remove the incorrect designation from the Maple Canyon SPS access road, the County has the option of preparing a supplement to the existing site record on a DPR 523L Continuation sheet and depicted on an updated DPR 523J Location Map the correct location of the segment of the SCE Transmission Line Road.

The extreme eastern end of SCE’s Verdugo Circuit (19-186860) extends over the access road west of BTR. This linear arrangement of poles is not expected to be impacted by the proposed Project and no mitigation is required.

The remnants of Hansen’s Lodge may be present under or adjacent to the access roads southwest of the Dam; however, because the paving of existing roads is not anticipated to require substantial grading that could impact native sediments or require grading outside the existing access road footprint, no impact to this site, if it still exists, is anticipated. No prehistoric archaeological sites are recorded in the vicinity of the Project site and no mitigation is required.

Would the project cause a substantial adverse change in the significance of an archaeological resource?

The current Project involves the excavation of sediment accumulated behind the Dam and the grading of a ramp that will extend into the reservoir to facilitate access by grading equipment. Therefore, there is a possibility that historical and/or archaeological materials would be uncovered during necessary excavations for the construction of the vehicle access road behind the Dam structure into BTR. Although the likelihood of encountering historic and/or archaeological resources on the Project site is considered low, this impact would be potentially significant. Mitigation Measure (MM) 1 describes procedures for monitoring and protocols to be followed in the event that cultural resources are discovered during grading. Implementation of this mitigation measure would reduce this potentially significant impact to a less than significant level under both the Low Emission Trucking Option and the Conveyor Belt System Option.

Would the project disturb or encounter any significant paleontological remains?

While excavations to significant depths may encounter significant sediments in the southwestern portion of the Project site, such excavations are not planned. The records search conducted by the Natural History Museum of Los Angeles County indicates no evidence of significant paleontological remains within proposed excavation areas. At the southwestern section, access roads that would be paved would not require deep excavations that may disturb underlying fossil remains. The Project would involve occasional localized filling or shallow grading to maintain the access roads at this location. This activity would result in the disturbance of non-native surficial sediments that have been previously disturbed. The Project would not excavate to a depth that could likely encounter paleontological resources. There would be less than significant impacts to paleontological resources.

Would the project disturb any human remains, including those interred outside of formal cemeteries?

There is no indication as a result of this study that human remains are present within the project site. The records search and field survey indicates no evidence of human remains on or near BTR or Maple Canyon SPS. The Project would not impact native sediments that were not previously disturbed by the construction of BTR or that flowed down from the upper reaches of Big Tujunga Creek. Recently deposited sediment, debris and vegetation that flowed with storm waters into BTR are not expected to contain any human remains, including those interred outside formal cemeteries.

In the unlikely event of an unanticipated encounter with human remains in BTR, the *California Health and Safety Code* and the *California Public Resources Code* require that any activity in the area of a potential find be halted and the Los Angeles County Coroner be notified, as described in MM 2. There would be less than significant adverse impacts to human remains with compliance with MM 2.

7.0 RECOMMENDATIONS AND MITIGATION

MITIGATION MEASURE 1

Should archaeological resources be found during ground-disturbing activities for the Project, an Archaeologist shall be hired to first determine whether it is a "unique archaeological resource" pursuant to Section 21083.2(g) of the *California Public Resources Code* (PRC) or a "historical resource" pursuant to Section 15064.5(a) of the State CEQA Guidelines. If the archaeological resource is determined to be a "unique archaeological resource" or a "historical resource", the Archaeologist shall formulate a mitigation plan in consultation with the Los Angeles County Department of Public Works that satisfies the requirements of the above-referenced sections. If the Archaeologist determines that the archaeological resource is not a "unique archaeological resource" or "historical resource", s/he may record the site and submit the recordation form to the California Historic Resources Information System at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton.

The Archaeologist shall prepare a report of the results of any study prepared as part of a testing or mitigation plan, following accepted professional practice. The report shall follow guidelines of the California Office of Historic Preservation. Copies of the report shall be submitted to the Los Angeles County Department of Public Works and to the California Historic Resources Information System at the South Central Coastal Information Center at California State University, Fullerton.

MITIGATION MEASURE 2

If human remains are encountered during excavation activities, all work shall halt in the immediate vicinity of the discovery and the County Coroner shall be notified (*California Public Resources Code* §5097.98). The Coroner shall determine whether the remains are of forensic interest. If the Coroner, with the aid of the County-approved Archaeologist, determines that the remains are prehistoric, s/he will contact the Native American Heritage Commission (NAHC). The NAHC shall be responsible for designating the most likely descendant (MLD), who will be responsible for the ultimate disposition of the remains, as required by Section 7050.5 of the *California Health and Safety Code.* The MLD shall make his/her recommendation within 48 hours of being granted access to the site. The MLD's recommendation shall be followed if feasible, and may include scientific removal and non-destructive analysis of the human remains and any items associated with Native American burials (*California Health and Safety Code* §7050.5). If the landowner rejects the MLD's recommendations, the landowner shall rebury the remains with appropriate dignity on the property in a location that will not be subject to further subsurface disturbance (*California Public Resources Code* §5097.98).

8.0 CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this cultural resources report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: June 2012 SIGNED:

Patrick O. Maxon., RPA
Director, Cultural Resources

Christopher Drover Ph.D., RPA
Cultural Resources

9.0 REFERENCES

Applegate, R.B.

1979 The Black, the Red, and the White: Duality and Unity in the Luiseño Cosmos. *The Journal of California and Great Basin Anthropology* 1(1):71-88.

Bada, J. L., R. A. Schroeder, and G. G. Carter

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Balls, E.K.

1970 *Early Uses of California Plants*. University of California Press, Berkeley.

Bean, J.L. and Saubel

1972 *Temalpakh: Cahuilla Indian Knowledge and Usage of Plants.* Malki Museum, Inc., Banning, California.

Bean, L.J., and C.R. Smith

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Berger, R., R. Protsch, R. Reynolds, C. Rozaire, and J. Sackett

1971 *New Radiocarbon date based on bone collagen of California Paleoindians*. Berkeley: Contributions of the University of California Archaeological Research Facility 12:43-49.

Drover, C.E., H.C. Koerper, and P.E. Langenwalter II

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Hitt, Marlene

2002 Sunland and Tujunga: From Village to City. Arcadia Publishing: Charleston, S.C.

Koerper, H.C., and C.E. Drover

1983 Chronology Building for Coastal Orange County: The Case from ORA-119-A. *Pacific Coast Archaeological Society Quarterly* 19(2):1-34.

Mason, R.D., W.H. Bonner, S.J. Bouscaren, L. Carbone, R.O. Gibson, L.P. Klug, M.L. Peterson and V. Popper

1997 San Joaquin Hills Transportation Corridor Results of Data Recovery at CA-ORA-225, vol. 2. Chambers Group, Inc., Irvine, California. Submitted to Sverdrup Corporation, Irvine, California and Transportation Corridor Agencies, Santa Ana, California.

Meighan, C.W.

1959 The Little Harbor Site, Catalina Island: An example of ecological interpretation in archaeology. *American Antiquity* 24(4):383-405.-

1954 A Late Complex in Southern California Prehistory. Southwestern Journal of Anthropology 10:215-227

Merriam, C. Hart

1968 Village Names in Twelve California Mission Records. Reports of the University of California Archaeological Survey 74, University of California Archaeological Research Facility, Berkeley.

Office of Historic Preservation

1990 *Archaeological Resource Management Reports (ARMR): Recommended Contents and* Format*.* Department of Parks and Recreation, Office of Historic Preservation, Sacramento, California.

Ruby, J.

1970 *Culture Contact Between Aboriginal Southern California and the Southwest*. Ph.D. dissertation, University of California, Los Angeles.

Schmidt and Schmidt

2003 Archaeological Site Record 19-186860. Southern Coastal California Information Center. California State University, Fullerton.

Singer, Clay A.

1985 Cultural Resources Survey and Impact Analysis for the Proposed Maple Canyon Relief Drain, Near Big Tujunga Dam in the Angeles National Forest, Los Angeles County, California. L-1477

USDAFS

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2011 The Colorful Characters of Early Big Tujunga Canyon. Explore California-Magazine for Enthusiasts. http://www.explorehistoricalif.com/may2011.html.

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1955 A Suggested Chronology for Southern California Coastal Archaeology. Southwestern Journal of Anthropology II :214-23th

Warren, C.N.

1966 Cultural Tradition and Ecological Adaptation on the Southern California Coast*.* In Archaic Prehistory in the Western United States, *Eastern New Mexico University Contributions in Anthropology* 1 (3):1-14.

Weeks, K. and Grimmer, A.

1995 *The Secretary of The Interior's Standards for the Treatment of Historic Properties: With Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings*. U.S. Department of the Interior, National Park Service, Cultural Resource Stewardship and Partnerships, Heritage Preservation Services (Washington, D.C.).

Yamada, Katherine

2011 Glendale News-Press. http://articles.glendalenewspress.com/2011-07-01/news/tn-gnp-0703-yamada_1_julio-and-catalina-verdugo-land-carroll-w-parcher.

APPENDIX A

CULTURAL RESOURCES RECORDS SEARCH (SCCIC and FS)

SCCIC Bibliography: Big Tujunga Reservoir

LA-01477

Author(s): Singer, Clay A.
Year: 1985
Title: Cultural Resources Survey and Impact Assessment for the Proposed Maple Canyon Relief Drain, Near Big Tujunga Dam in the Angeles National Forest, Los Angeles County, Ca
Affiliation:
Resources:
Quads: CONDOR PEAK
Pages:
Notes:

LA-01529

Author(s): McIntyre, Michael J.
Year: 1985
Title: Archaeological Reconnaissance Report: Lower Big Tujunga Vegation Management Arr
Affiliation: U.S. Forest Service
Resources:
Quads: CONDOR PEAK
Pages:
Notes:

LA-03053

Author(s): Anonymous
Year: 1994
Title: Cultural Resources Assessment Angeles Forest Highway at Mile Marker 23.00 Angeles National Forest Los Angeles County, California
Affiliation: LSA Associates, Inc.
Resources:
Quads: CONDOR PEAK
Pages:
Notes:

LA-05454

Author(s): Romani, Gwendolyn R.
Year: 2000
Title: Negative Archaeological Survey Report Southern California Edison: Fall Creek 2
Affiliation: Compass Rose Archaeological, Inc.
Resources:
Quads: CONDOR PEAK
Pages:
Notes:

LA-05510

Author(s): Romani, Gwendolyn R.
Year: 1999
Title: Sce Road Repair, Angeles National Forest, Los Angeles County Archaeological Survey Report
Affiliation: Compass Rose Archaeological, Inc.
Resources:
Quads: MT WILSON
Pages:
Notes:

LA-06789

Author(s): Storey, Noelle
Year: 2002
Title: Tom Ross Honey Company Apiary Site (special Use Permit Issuance Lar 504603) Angeles National Forest, Los Angeles County, California
Affiliation: Angeles National Forest
Resources:
Quads: CONDOR PEAK
Pages:
Notes:

LA-07154

Author(s): Bartoy, Kevin M.
Year: 2003
Title: Clear Creek School Camp Water Acquisition, Conveyance and Storage System Angeles National Forest, Los Angeles County, California
Affiliation: Pacific Legacy, Inc.
Resources:
Quads: CONDOR PEAK
Pages:
Notes: ARR # 05-01-00-868

LA-07155

Author(s): Bartoy, Kevin M.
Year: 2003
Title: La County Flood Control Tanks Angeles National Forest, Los Angeles County, California
Affiliation: Pacific Legacy, Inc.
Resources:
Quads: CONDOR PEAK
Pages:
Notes: ARR # 05-01-00-841

LA-07283

Author(s): Brasket, Kelli S.
Year: 2004
Title: Wildwood, Tujunga and Fall Creek Plantations Project Angeles National Forest, Los Angeles County, Ca (arr#05-01-000935)
Affiliation: Angeles National Forest
Resources: 19-003386
Quads: CONDOR PEAK
Pages:
Notes:

LA-08184

Author(s): Bartoy, Kevin M.
Year: 2004
Title: Clear Creek Fuelbreak Improvement Project, Angeles National Forest, Los Angeles County, California
Affiliation: Pacific Legacy, Inc.
Resources:
Quads: CONDOR PEAK
Pages:
Notes:

LA-09733

Author(s): Romani, Gwen
Year: 2004
Title: ARR #05-01-00827: Phase I Cultural Resource Investigation: LARRD Hazard Reduction, Organized Camps hazardous Fuels Reduction Project, Angeles National Forest, Los Angeles County, California.
Affiliation: Compass Rose, Inc
Resources: 19-003471
Quads: CHILAO FLAT, CONDOR PEAK, WATERMAN MTN
Pages: 40
Notes:

LA-09744

Author(s): Romani, Gwendolyn R.
Year: 1999
Title: Results of Archaeological Survey: Big Tujunga Arundo Removal (ARR No. 05-01-00569)
Affiliation: Compass Rose Archaeological, Inc
Resources: 19-001153, 19-002051
Quads: CHILAO FLAT, CONDOR PEAK, SUNLAND
Pages: 22
Notes:

LA-09746

Author(s): Schmidt, James and Gwen Romani
Year: 2003
Title: Phase I Cultural Resource Investigation: Southern California Edison, Verdugo Distribution Line Circuit, Angeles National Forest, Los Angeles County (ARR No. 05-01-00825)
Affiliation: Compass Rose Archaeological, Inc.
Resources: 19-001153, 19-001980, 19-002051, 19-186860
Quads: CONDOR PEAK, SUNLAND
Pages: 20
Notes:

LA-10175

Author(s): Unknown
Year: 2009
Title: Confidential Cultural Resources Specialist Report for the Tehachapi Transmission Project
Affiliation: Applied Earthworks, Aspen Environmental Group
Resources: 19-000806, 19-001128, 19-001299, 19-001300, 19-001315, 19-001357, 19-001382, 19-001636, 19-001770, 19-001771, 19-001783, 19-001956, 19-001957, 19-002206, 19-002212, 19-002343, 19-002350, 19-002363, 19-002411, 19-002412, 19-003009, 19-003018, 19-003025, 19-003031, 19-003032, 19-003037, 19-003090, 19-003099, 19-003136, 19-003152, 19-003295, 19-003385, 19-003477, 19-003606, 19-003638, 19-003795, 19-003852, 19-003853, 19-003854, 19-100277, 19-100439, 19-100496, 19-100644, 19-120031, 19-120032, 19-120072, 19-120074, 19-180689, 19-186545, 19-186860, 19-186870, 19-186871, 19-186872, 19-186873, 19-186875, 19-186876, 19-186877, 19-186917, 19-186921, 19-186923, 19-186925, 19-187713
Quads: ACTON, AZUSA, BALDWIN PARK, CHILAO FLAT, CONDOR PEAK, DEL SUR, EL MONTE, FAIRMONT BUTTE, LA HABRA, LAKE HUGHES, LANCASTER WEST, LITTLE BUTTES, LOS ANGELES, MT WILSON, PACIFICO MOUNTAIN, PALMDALE, PASADENA, RITTER RIDGE, SLEEPY VALLEY, WATERMAN MTN, WHITTIER, YORBA LINDA
Pages: 234
Notes: Also OR 3777

LA-10470

Author(s): Schmidt, James

Year: 2010

Title: Archaeological Monitoring Report - Southern California Edison Station Fire Emergency Transmission Line Road Maintenance Project Project, Angeles National Forest, Los Angeles County, California ARR# 05-01-1154

Affliliation: Compass Rose Archaeological

Resources: 19-000241, 19-000902, 19-001128, 19-001359, 19-001382, 19-001572, 19-002350, 19-002359, 19-002361, 19-002363, 19-002411, 19-002412, 19-002987, 19-002989, 19-002991, 19-002994, 19-002995, 19-002996, 19-002997, 19-002998, 19-003000, 19-003004, 19-003005, 19-003008, 19-003009, 19-003018, 19-003025, 19-003037, 19-003136, 19-003141, 19-003152, 19-003295, 19-003562, 19-003606, 19-003722, 19-003730, 19-003731, 19-003732, 19-100438, 19-100496, 19-186545, 19-186876, 19-186877, 19-186901, 19-186923, 19-186925, 19-187713

Quads: ACTON, AZUSA, CHILAO FLAT, CONDOR PEAK, MT WILSON, PACIFICO MOUNTAIN

Pages: 31

Notes:

APPENDIX B

PALEONTOLOGICAL RESOURCES RECORDS SEARCH (LACM)

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Vertebrate Paleontology
Telephone: (213) 763-3248
FAX: (213) 746-7431
e-mail: vrhue@nhm.org

NATURAL HISTORY MUSEUM
LOS ANGELES COUNTY

27 October 2011

BonTerra Consulting
151 Kalmus Drive, Suite E-200
Costa Mesa, CA 92626-7969

Attn: Patrick O. Maxon, Director, Cultural Resources

re: Paleontological Resources for the proposed Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project, in Big Tujunga Canyon, Los Angeles County, project area

Dear Patrick:

I have conducted a thorough search of our Vertebrate Paleontology records for the proposed Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project, in Big Tujunga Canyon, Los Angeles County, project area as outlined on the portion of the Condor Peak USGS topographic quadrangle map that you sent to me via e-mail on 3 October 2011. We do not have any vertebrate fossil localities that lie within the proposed project boundaries, nor do we have any localities very nearby from sedimentary deposits that occur in the proposed project area.

Bedrock in most of the proposed project area is composed of plutonic igneous rocks that, of course, will be devoid of fossils. In the southwestern portion of the proposed project area there are surficial deposits of older Quaternary Alluvium, probably as a mixture of fan and fluvial deposits. Below the Big Tujunga Dam there are deposits of younger Quaternary Alluvium, albeit as coarse gravelly deposits. These latter types of sedimentary deposits typically do not contain vertebrate fossils, at least in the uppermost layers, and we do not have any vertebrate fossil localities very nearby from these deposits.

Excavations in the igneous bedrock occurring throughout most of the proposed project area will not encounter any fossils. Shallow excavations in the Quaternary deposits exposed in the southwestern portion of the proposed project area probably will not uncover significant vertebrate fossils. Deeper excavation in the latter portion of the proposed project area, however, may encounter significant vertebrate fossils. Any substantial excavations in the sedimentary deposits exposed in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Any fossil materials uncovered during mitigation activities should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod

Samuel A. McLeod
Vertebrate Paleontology

enclosure: draft invoice

APPENDIX C

NATIVE AMERICAN CONSULTATION (NAHC)

BonTerra CONSULTING

TRANSMITTAL

DATE: September 22, 2011

TO:	Mr. Dave Singleton	**FAX NUMBER:**	(916) 657-5390
	Program Analyst	**TEL NUMBER:**	(916) 653-6251
	Native American Heritage Comm.	**PROJECT:**	**Big Tujunga Reservoir Sediment Removal**
	915 Capitol Mall, Rm. 364		
	Sacramento, CA 95814	**FROM:**	Patrick Maxon, RPA

☒ Fax / Pages_ ☒ E-Mail ☐ Fed Ex / Overnite Express ☐ Delivery / Courier

REGARDING: Sacred Lands File Search and Contact List Request

Dear Mr. Singleton:

BonTerra Consulting has been retained to complete a cultural resources study for three proposed **Big Tujunga Reservoir Sediment Removal Project** located in Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines).

At your earliest convenience, please conduct searches of the Sacred Lands File for the **Big Tujunga Reservoir Sediment Removal Project** and a one-mile radius. The project site is located on a portion of the USGS ***Condor Peak, CA*** 7.5 Minute Quadrangles in Township 2 and 3 North; Range 12 and 13 West (*S.B.B.M*).

The project entails the removal of alluvial sediment deposited into the Big Tujunga Reservoir. The project includes grading and widening of access roads to and from the reservoir.

Please fax the results to me at (714) 444-9599, or e-mail to pmaxon@bonterraconsulting.com, referencing your letter to the "**Big Tujunga Reservoir Sediment Removal Project** ".

If you have any questions or require any additional information, please do not hesitate to contact me at (714) 444-9199 or via email.

Sincerely,

BONTERRA CONSULTING

Patrick Maxon, RPA
Director, Cultural Resources

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

September 26, 2011

Mr. Patrick Maxon, RPA, Director, Cultural Resources
Bonterra Consulting
151 Kalmus Drive, Suite E-200
Costa Mesa, CA 92626

Sent by FAX to: 714-444-9599
No. of Pages: 4

Re: Sacred Lands File Search and Native American Contacts list for the **"Big Tujunga Reservoir Sediment Removal Project;"** located in the Tujunga Canyon; Los Angeles County, California

Dear Mr. Maxon:

The Native American Heritage Commission (NAHC) conducted a Sacred Lands File search of the 'area of potential effect,' (APE) based on the USGS coordinates provided and **Native American cultural resources were not identified** in the USGS coordinates you specified. Also, please note; the NAHC Sacred Lands Inventory is not exhaustive and do not preclude the discovery of cultural resources during ground braking activity. There are Native American cultural resources in close proximity to the APE.

The California Environmental Quality Act (CEQA – CA Public Resources Code §§ 21000-21177, amendments effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the CEQA Guidelines defines a significant impact on the environment as 'a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. CA Government Code §65040.12(e) defines "environmental justice" provisions and is applicable to the environmental review processes.

Early consultation, even during Initial Study or First Phase surveys with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Local Native Americans may have knowledge of the religious and cultural significance of the historic properties of the proposed project for the area (e.g. APE). Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). We urge consultation with those tribes and interested Native Americans on the list of Native American Contacts we attach to this letter in order to see if your proposed project might impact Native American cultural resources. Lead agencies should consider avoidance as defined in §15370 of the CEQA Guidelines when significant cultural resources as defined by the CEQA Guidelines §15064.5 (b)(c)(f) may be affected by a proposed project. If so, Section 15382 of the CEQA Guidelines defines a significant impact on the environment as "substantial," and Section 2183.2 which requires documentation, data recovery of cultural resources. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation. The aforementioned Secretary of the Interior's *Standards* include recommendations for all 'lead agencies' to consider the historic context of proposed projects and to "research" the cultural landscape that might include the 'area of potential effect.'

Partnering with local tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA (42 U.S.C 4321-43351) and Section 106 4(f), Section 110 (f)(k) of federal NHPA (16 U.S.C. 470 *et seq*), 36 CFR Part 800.3 (f) (2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 *et seq.* and NAGPRA (25 U.S.C. 3001-3013) as appropriate. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation.

Also, California Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery', another important reason to have Native American Monitors on board with the project.

To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. An excellent way to reinforce the relationship between a project and local tribes is to employ Native American Monitors in all phases of proposed projects including the planning phases.

Confidentiality of "historic properties of religious and cultural significance" may also be protected under Section 304 of he NHPA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibility threatened by proposed project activity.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton

Attachment: Native American Contact List

Native American Contacts
Los Angeles County
September 26, 2011

Charles Cooke
32835 Santiago Road
Acton , CA 93510
suscol@intox.net

(661) 733-1812 - cell
suscol@intox.net

Chumash
Fernandeno
Tataviam
Kitanemuk

Kitanemuk & Yowlumne Tejon Indians
Delia Dominguez, Chairperson
981 N. Virginia
Covina , CA 91722
deedominguez@juno.com
(626) 339-6785

Yowlumne
Kitanemuk

Beverly Salazar Folkes
1931 Shadybrook Drive
Thousand Oaks, CA 91362
folkes@msn.com
805 492-7255
(805) 558-1154 - cell
folkes9@msn.com

Chumash
Tataviam
Ferrnandeño

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838
Newhall , CA 91322
tsen2u@hotmail.com
(661) 753-9833 Office
(760) 885-0955 Cell
(760) 949-1604 Fax

Fernandeño
Tataviam
Serrano
Vanyume
Kitanemuk

Fernandeno Tataviam Band of Mission Indians
Ronnie Salas, Cultural Preservation Department
601 South Brand Boulevard, Suite 102
San Fernando CA 91340
rsalas@tataviam-nsn.gov
(818) 837-0794 Office

(818) 837-0796 Fax

Fernandeno
Tataviam

Randy Guzman - Folkes
655 Los Angeles Avenue, Unit E
Moorpark , CA 93021
ndnRandy@yahoo.com
(805) 905-1675 - cell

Chumash
Fernandeño
Tataviam
Shoshone Paiute
Yaqui

LA City/County Native American Indian Comm
Ron Andrade, Director
3175 West 6th St, Rm. 403
Los Angeles , CA 90020
randrade@css.lacounty.gov
(213) 351-5324
(213) 386-3995 FAX

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable for contacting local Native Americans with regard to cultural resources for the proposed "Big Tujunga Reservoir Sediment Removal Project;" located in the Angeles National Forest area; Los Angeles County, California for which a Sacred Lands File search and Native American Contacts list were requested.

BonTerra
CONSULTING

PASADENA COSTA MESA

T: (714) 444-9199 F: (714) 444-9599
www.BonTerraConsulting.com

151 Kalmus Drive, Suite E-200
Costa Mesa, CA 92626

September 27, 2011

Mr. Ron Andrade
LA City/County Native American Indian Comm.
3175 W. 6th Street, Rm. 403
Los Angeles, California 90020

Subject: Big Tujunga Reservoir Sediment Removal Project

Dear Mr. Andrade:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed Big Tujunga Reservoir Sediment Removal Project located in Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject to the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines). However, as part of the background cultural resources research being conducted, this letter is to inform you of the proposed project and to request any relevant information you may have regarding cultural resources on or near the project site.

Location

The project site is located on a portion of the USGS Condor Peak, *CA* 7.5 Minute Quadrangles in Township 2 and 3 North; Range 12 and 13 West (*S.B.B.M*). See attached exhibit.

Project

The Project entails the removal of alluvial sediment deposited into the Big Tujunga Reservoir. The project includes grading and widening of access roads to and from the reservoir. BonTerra will produce a cultural resources report that will identify any significant issues related to any cultural resources on the property.

NAHC Notification

A Sacred Lands File Search conducted by the Native American Heritage Commission (NAHC) did not identify the presence of Native American cultural resources on the project site. The NAHC also provided BonTerra Consulting with a list of Native American individuals/organizations that may have knowledge of cultural resources in the project area. Your name and contact information was included on the list and serves as the basis for this letter.

Records Search/Survey

An archaeological/historic records search will be conducted at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton to evaluate the existing conditions of the project site. A survey of the project site will be completed after the records search to identify any exposed cultural resources.

Your participation in this local planning process is important. If you have any additional knowledge of Native American Sacred Lands or other cultural resources on or near the study area, or any comment on the project, please contact me at your earliest convenience at (714) 444-9199 or via email at pmaxon@bonterraconsulting.com, with a subject line referencing the "Big Tujunga Reservoir Sediment Removal Project".

Sincerely,

BONTERRA CONSULTING

Patrick O. Maxon, RPA
Director – Cultural Resources

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BonTerra
CONSULTING

PASADENA COSTA MESA

T: (714) 444-9199 F: (714) 444-9599
www.BonTerraConsulting.com

151 Kalmus Drive, Suite E-200
Costa Mesa, CA 92626

September 27, 2011

Mr. Charles Cooke
Tehachapi Indian Tribe
32835 Santiago Road
Acton, California 93510

Subject: Big Tujunga Reservoir Sediment Removal Project

Dear Mr. Cooke:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed Big Tujunga Reservoir Sediment Removal Project located in Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject to the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines). However, as part of the background cultural resources research being conducted, this letter is to inform you of the proposed project and to request any relevant information you may have regarding cultural resources on or near the project site.

Location

The project site is located on a portion of the USGS Condor Peak, *CA* 7.5 Minute Quadrangles in Township 2 and 3 North; Range 12 and 13 West (*S.B.B.M*). See attached exhibit.

Project

The Project entails the removal of alluvial sediment deposited into the Big Tujunga Reservoir. The project includes grading and widening of access roads to and from the reservoir. BonTerra will produce a cultural resources report that will identify any significant issues related to any cultural resources on the property.

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A Sacred Lands File Search conducted by the Native American Heritage Commission (NAHC) did not identify the presence of Native American cultural resources on the project site. The NAHC also provided BonTerra Consulting with a list of Native American individuals/organizations that may have knowledge of cultural resources in the project area. Your name and contact information was included on the list and serves as the basis for this letter.

Records Search/Survey

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Your participation in this local planning process is important. If you have any additional knowledge of Native American Sacred Lands or other cultural resources on or near the study area, or any comment on the project, please contact me at your earliest convenience at (714) 444-9199 or via email at pmaxon@bonterraconsulting.com, with a subject line referencing the "Big Tujunga Reservoir Sediment Removal Project".

Sincerely,

BONTERRA CONSULTING

Patrick O. Maxon, RPA
Director – Cultural Resources

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BonTerra
CONSULTING

PASADENA COSTA MESA

T: (714) 444-9199 F: (714) 444-9599
www.BonTerraConsulting.com

151 Kalmus Drive, Suite E-200
Costa Mesa, CA 92626

September 27, 2011

Ms. Delia Dominguez
Kitanemuk & Yowlumne Tejon Indians
981 N. Virginia
Covina, California 91722

Subject: Big Tujunga Reservoir Sediment Removal Project

Dear Ms. Dominguez:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed Big Tujunga Reservoir Sediment Removal Project located in Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject to the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines). However, as part of the background cultural resources research being conducted, this letter is to inform you of the proposed project and to request any relevant information you may have regarding cultural resources on or near the project site.

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151 Kalmus Drive, Suite E-200
Costa Mesa, CA 92626

September 27, 2011

Mr. Randy Guzman-Folkes
655 Los Angeles Avenue
Unit E
Moorpark, California 93021

Subject: Big Tujunga Reservoir Sediment Removal Project

Dear Mr. Guzman-Folkes:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed Big Tujunga Reservoir Sediment Removal Project located in Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject to the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines). However, as part of the background cultural resources research being conducted, this letter is to inform you of the proposed project and to request any relevant information you may have regarding cultural resources on or near the project site.

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Director – Cultural Resources

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Costa Mesa, CA 92626

September 27, 2011

Mr. Ronnie Salas
Fernandeno Tataviam Band of Mission Indians
601 South Brand Blvd. Suite 102
San Fernando, California 91340

Subject: Big Tujunga Reservoir Sediment Removal Project

Dear Mr. Salas:

BonTerra Consulting has been retained to complete a cultural resources study for the proposed Big Tujunga Reservoir Sediment Removal Project located in Los Angeles County, California. This project does not require a General or Specific Plan amendment or adoption; therefore, the project is not subject to the statutory requirements of Senate Bill 18 (Tribal Consultation Guidelines). However, as part of the background cultural resources research being conducted, this letter is to inform you of the proposed project and to request any relevant information you may have regarding cultural resources on or near the project site.

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Sincerely,

BONTERRA CONSULTING

Patrick Maxon

Patrick O. Maxon, RPA
Director – Cultural Resources

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www.BonTerraConsulting.com

151 Kalmus Drive, Suite E-200
Costa Mesa, CA 92626

September 27, 2011

Ms. Beverly Salazar Folkes
1931 Shadybrook Drive
Thousand Oaks, California 91362

Subject: Big Tujunga Reservoir Sediment Removal Project

Dear Ms. Salazar Folkes:

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Costa Mesa, CA 92626

September 27, 2011

Mr. John Valenzuela
San Fernando Band of Mission Indians
P.O. Box 221838
Newhall, California 91322

Subject: Big Tujunga Reservoir Sediment Removal Project

Dear Mr. Valenzuela:

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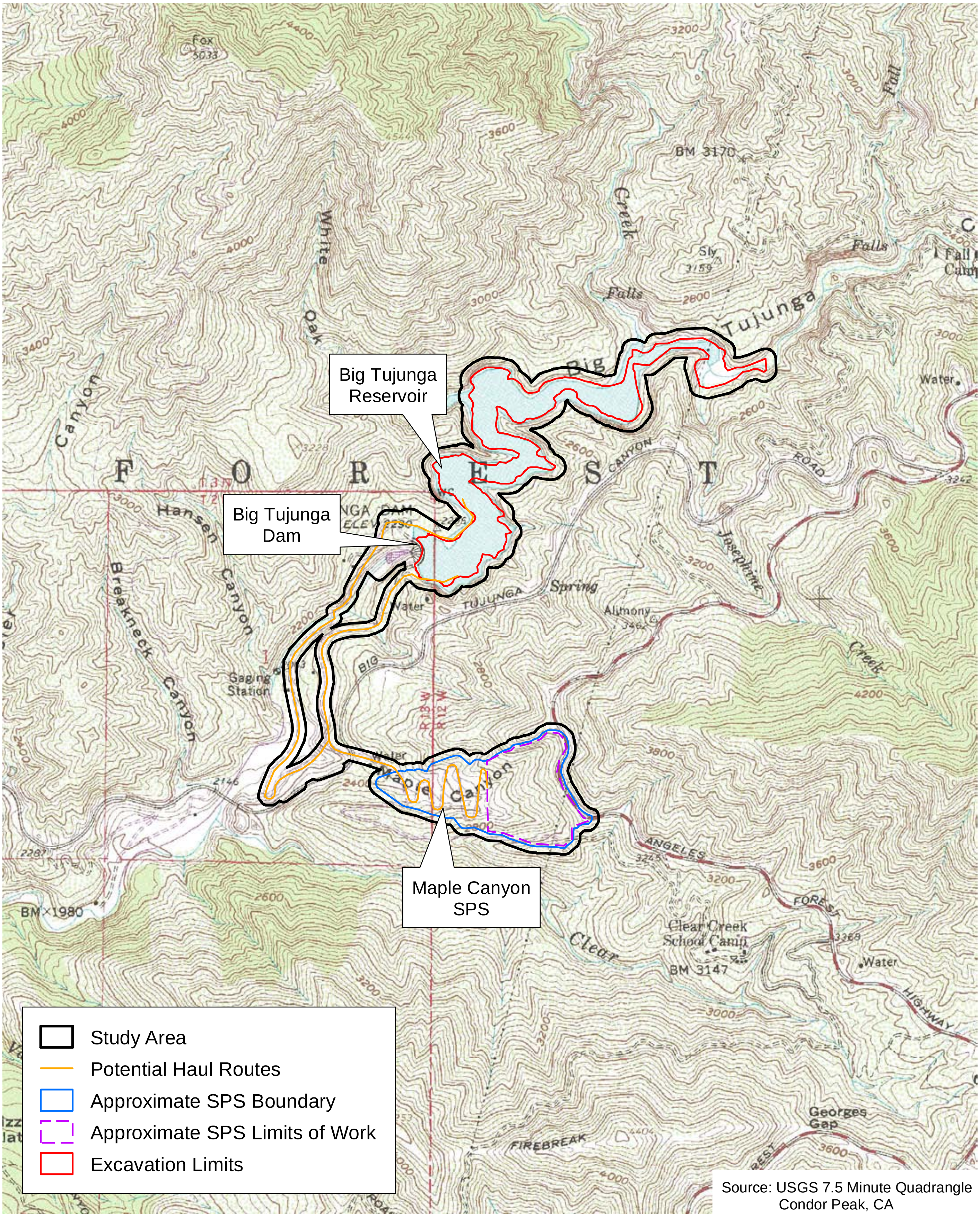

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U.S. Geological Survey 7.5-Minute Quadrangle

Exhibit 2

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

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Feet

BonTerra
CONSULTING

(Rev: 6-21-2011 CJS) R:\PAS\Projects\CoLADPW\J162\Graphics\Bio\Ex2_LV_quad.pdf

APPENDIX D

FOREST SERVICE PERMIT

SEP 2 9 2011

Authorization ID: LAR9040CRI
Contact ID: BON TERRA
Expiration Date: 09/26/2012

FS-2700-32 (10/09)
OMB No. 0596-0082

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

PERMIT FOR ARCHAEOLOGICAL INVESTIGATIONS

Authority:
The Antiquities Act of 1906, 16 U.S.C. 431-433
The Organic Act of 1897, 16 U.S.C. 551

<table>
<tr><td>1. Holder

BON TERRA CONSULTING</td><td>2. Date of corresponding application

9/13/2011</td></tr>
<tr><td rowspan="2">3. Address

Attn: Patrick Maxon
151 Kalmus, E-200
Costa Mesa, CA 92626</td><td>4. Telephone numbers
714/444/9199(office)</td></tr>
<tr><td>5. Email addresses
pmaxon@bonterraconsulting.com</td></tr>
<tr><td>6. Name of authorized officer

Michael J. McIntyre, District Ranger

Telephone numbers
818/899/1900 x223

Email addresses</td><td>7. Name of principal investigators
Patrick Maxon

Telephone numbers
714/444/9199(office)

Email addresses
pmaxon@bonterraconsulting.com</td></tr>
<tr><td>8. Name of field directors authorized to carry out field projects

Patrick Maxon and Albert Knight</td><td>Telephone numbers
714/444/9199(Maxon)

818/426/4730(Knight)
Email addresses
pmaxon@bonterraconsulting.com

ahunknight@msn.com</td></tr>
<tr><td colspan="2">9. Activities authorized

Consulting: Project-specific
Non-ground-disturbing activities (such as surveys)</td></tr>
<tr><td colspan="2">10. Description of National Forest System lands authorized for use (hereinafter referred to as "the permit area")

Cultural resource study for the excavation of sediment within the Big Tujunga Reservoir and the deposition of the sediment in the Maple Canyon Sediment Placement Site within Big Tujunga Canyon.</td></tr>
</table>

11. Permit term From September 26, 2011 To September 26, 2012
12. Name and address of the curatorial facility in which collections, records, data, photographs, and other documents resulting from activities conducted under this permit shall be deposited for permanent preservation on behalf of the United States Government. USDA Forest Service Attn: Darrell Vance 701 N. Santa Anita Ave. Arcadia, CA 91006

TERMS AND CONDITIONS

I. GENERAL TERMS

A. AUTHORITY. This permit is issued pursuant to The Organic Act of 1897, 16 U.S.C. 551, 36 CFR Part 251, Subpart B, 36 CFR Part 296, the Uniform Rules and Regulations of the Antiquities Act of 1906, 43 CFR Part 3, and applicable Forest Service policies and procedures and is subject to their provisions.

B. AUTHORIZED OFFICER. The authorized officer for this permit is the Forest Supervisor or a subordinate officer with delegated authority.

C. ANNUAL REVIEW. If this permit is issued for more than one year, it shall be reviewed annually by the authorized officer.

D. RENEWAL AND EXTENSION. This permit is not renewable. The holder may request an extension of this permit for a limited, specified period to complete activities authorized under this permit. Requests for an extension must be submitted in writing at least one month before expiration of this permit.

E. AMENDMENT. This permit may be amended in whole or in part by the Forest Service when, at the discretion of the authorized officer, such action is deemed necessary or desirable to incorporate new terms that may be required by law, regulation, the applicable land management plan, or projects and activities implementing a land management plan pursuant to 36 CFR Part 215. Any amendments to individuals named in or activities authorized by this permit that are needed by the holder must be approved by the authorized officer in writing.

F. COMPLIANCE WITH LAWS, REGULATIONS, AND OTHER LEGAL REQUIREMENTS. In exercising the privileges granted by this permit, the holder shall comply with all present and future federal laws and regulations and all present and future state, county, and municipal laws, regulations, and other legal requirements that apply to the permit area, to the extent they do not conflict with federal law, regulations, or policy. The Forest Service assumes no responsibility for enforcing laws, regulations, and other legal requirements that fall under the jurisdiction of other governmental entities.

G. NON-EXCLUSIVE USE. The use and occupancy authorized by this permit are not exclusive. The Forest Service reserves the right of access to the permit area, including a continuing right of physical entry to the permit area for inspection, monitoring, or any other purpose consistent with any right or obligation of the United States under any law or regulation. The holder shall allow the authorized officer or the authorized officer's representative full access to the permit area at any time the holder is in the field for purposes of examining the permit area and any recovered materials and related records. The Forest Service reserves the right to allow others to use the permit area in any way that is not inconsistent with the holder's rights and privileges under this permit, after consultation with all parties involved.

H. ASSIGNABILITY. This permit is not assignable or transferable.

II. OPERATIONS

A. OPERATING PLAN. The application corresponding to this permit is incorporated as the operating plan for this permit and is attached as Appendix A. The authorized officer may supplement the information contained in the application as appropriate or necessary.

B. REQUIRED PERMITS. The holder shall obtain all other permits required for conducting the activities authorized by this permit.

C. QUALIFIED INDIVIDUALS. Archaeological project design, literature review, development of regional historical contexts, site evaluation, conservation and protection measures, and recommendations for subsequent investigations shall be developed with direct involvement of an individual who meets the Secretary of the Interior's Standards for Archaeology and Historic Preservation. Fieldwork shall be overseen by an individual who meets the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

D. CONDITION OF OPERATIONS. The holder shall maintain the authorized improvements and permit area to standards of repair, orderliness, neatness, sanitation, and safety acceptable to the authorized officer and consistent with other provisions of this permit. Standards are subject to periodic change by the authorized officer.

E. PROHIBITION ON USE OF MECHANIZED EQUIPMENT IN WILDERNESS AREAS. The holder shall not use mechanized equipment in wilderness areas and shall not use mechanized equipment in proposed or potential wilderness areas without prior written approval from the authorized officer.

F. PROHIBITION ON FLINT KNAPPING AND LITHIC REPLICATION EXPERIMENTS. The holder shall not conduct any flint knapping or lithic replication experiments at any archaeological site, aboriginal quarry source, or non-archaeological site that might be mistaken for an archaeological site as a result of such experiments.

G. PROHIBITION ON IMPEDING OR INTERFERING WITH OTHER USES. The holder shall perform the activities authorized by this permit so as not to impede or interfere with administrative or other authorized uses of National Forest System lands.

H. RESTRICTION ON MOTOR VEHICLE USE. The holder shall restrict motor vehicle use to designated roads, trails, and areas, unless specifically provided otherwise in the operating plan.

I. MINIMIZING GROUND DISTURBANCE. The holder shall keep ground disturbance to a minimum consistent with the nature and purpose of the authorized fieldwork.

J. RESOURCE PROTECTION. The holder shall conduct all activities so as to prevent or minimize scarring, erosion, littering, and pollution of National Forest System lands, water pollution, and damage to watersheds. In addition, the holder shall take precautions at all times to prevent wildfire. The holder may not burn debris without prior written approval from the authorized officer.

K. PREVENTION OF INJURY. The holder shall take precautions to protect livestock, wildlife, the public, and other users of National Forest System lands from accidental injury at any excavation site.

L. DESTRUCTION AND REMOVAL OF TREES. The holder shall not destroy or remove any trees on National Forest System lands without prior written approval from the authorized officer.

M. RESOURCE MANAGEMENT FACILITIES. The holder shall not disturb resource management facilities, such as fences, reservoirs, and other improvements, within the permit area without prior written approval from the authorized officer. Where disturbance of a resource management facility is necessary, the holder shall return it to its prior location and condition.

N. BACKFILLING. The holder shall backfill all subsurface test and excavation sites as soon as possible after recording the results and shall restore subsurface test and excavation sites as closely as possible to their original contour.

O. REMOVAL OF STAKES AND FLAGGING. The holder shall remove temporary stakes and flagging installed by the holder upon completion of fieldwork.

P. SITE RESTORATION. The holder shall restore all camp and work areas to their original condition before vacating the permit area. Refuse shall be carried out and deposited in disposal areas approved by the authorized officer.

Q. TITLE TO ARTIFACTS AND ASSOCIATED DOCUMENTATION. Archaeological and historical artifacts excavated or removed from National Forest System lands and any associated documentation shall remain the property of the United States.

R. NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION (NAGPRA). In accordance with 25 U.S.C. 3002 (d) and 43 CFR 10.4, if the holder inadvertently discovers human remains, funerary objects, sacred objects, or objects of cultural patrimony on National Forest System lands, the holder shall immediately cease work in the area of the discovery and shall make a reasonable effort to protect and secure the items. The holder shall immediately notify the authorized officer by telephone of the discovery and shall follow up with written confirmation of the discovery. The activity that resulted in the inadvertent discovery may not resume until 30 days after the authorized officer certifies receipt of the written confirmation, if resumption of the activity is otherwise lawful, or at any time if a binding written agreement has been executed between the Forest Service and the affiliated Indian tribes that adopts a recovery plan for the human remains and objects.

S. ADDITIONAL REQUIREMENTS. Prior to beginning any fieldwork under the authority of this permit, the holder shall contact the authorized officer responsible for administering the lands involved to obtain further instructions regarding current land and resource conditions.

III. REPORTING REQUIREMENTS

A. PRELIMINARY REPORT. The holder shall submit a preliminary report to the authorized officer within 30 days of completion of the first stage of fieldwork. The preliminary report shall enumerate what was done during the first stage of fieldwork, how it was done, by whom, where, and with what results, including maps, global positioning satellite data, an approved site form for each newly recorded archaeological site, and the holder's professional recommendations regarding resource significance, as appropriate. Depending on the scope, duration, and nature of the work, the authorized officer may require progress reports periodically for the duration of the authorized activities.

B. DRAFT FINAL REPORT. Within 60 days of completion of fieldwork, the holder shall submit an edited draft final report to the authorized officer for review to ensure conformance with applicable laws, regulations, policies, and procedures and the terms and conditions of this permit.

C. FINAL REPORT. The holder shall submit the original final report and at least two copies to the authorized officer within 90 days after completion of fieldwork.

D. BLANKET SURVEY CONSULTING PERMIT. If this is a multi-year survey consulting permit, at the end of each calendar year, the holder shall submit to the authorized officer a report enumerating all activities conducted under this permit.

E. DEPOSIT OF MATERIALS AND DOCUMENTS WITH A CURATORIAL FACILITY. Within 90 days of the date the final report is submitted to the authorized officer, the holder shall deposit all artifacts, samples, and collections and original or clear copies of all records, data, photographs, and other documents resulting from activities authorized by this permit with the curatorial facility named in block 12.

F. CATALOGUE AND EVALUATION OF DEPOSITED MATERIALS. The holder shall provide the authorized officer with a catalogue and evaluation of all materials deposited with the curatorial facility named in block 12, including the facility's accession or catalogue numbers, and confirmation, signed by an authorized curatorial facility official, that artifacts, samples, and collections were deposited with the approved curatorial facility. The confirmation shall include the date the materials were deposited and the type, number, and condition of the deposited materials.

G. CONFIDENTIALITY OF SENSITIVE RESOURCES. The holder agrees to keep the specific location of sensitive resources confidential. Sensitive resources include but are not limited to threatened, endangered, and rare species; archaeological sites; caves; fossil sites; minerals; commercially valuable resources; and traditional cultural properties.

H. CONFIDENTIALITY OF INFORMATION IDENTIFYING ARCHAEOLOGICAL SITES. Without the authorized officer's prior written approval, the holder shall not publish any locational or other information identifying archaeological sites that could compromise their protection and management by the federal government.

I. IDENTIFICATION OF FOREST SERVICE PERMIT. Any published article, paper, or book containing results of work conducted under this permit shall specify that the work was performed in the Angeles National Forest under a Forest Service permit.

J. SUBMISSION OF WRITTEN MATERIALS. The holder shall submit a copy of any published or unpublished report, article, paper, or book resulting from the authorized activities (other than reports required by clauses III.A, B, and C) to the authorized officer and the appropriate official of the curatorial facility named in block 12. The holder shall submit tabular and spatial data to the authorized officer in the format specified in Appendix A.

IV. RIGHTS AND LIABILITIES

A. LEGAL EFFECT OF THE PERMIT. This permit, which is revocable and terminable, is not a contract or a lease, but rather a federal license. The benefits and requirements conferred by this authorization are reviewable solely under the procedures set forth in 36 CFR Part 251, Subpart C, and 5 U.S.C. 704. This permit does not constitute a contract for purposes of the Contract Disputes Act, 41 U.S.C. 601. The permit is not real property, does not convey any interest in real property, and may not be used as collateral for a loan.

B. VALID OUTSTANDING RIGHTS. This permit is subject to all valid outstanding rights. Valid outstanding rights include those derived from mining and mineral leasing laws of the United States. The United States is not liable to the holder for the exercise of any such right.

C. ABSENCE OF THIRD-PARTY BENEFICIARY RIGHTS. The signatories of this permit do not intend to confer any rights on any third party as a beneficiary under this permit.

D. DAMAGE TO UNITED STATES PROPERTY. The holder has an affirmative duty to protect from damage the land, property, and other interests of the United States. Damage includes but is not limited to fire suppression costs, and all costs and damages associated with or resulting from the release or threatened release of a hazardous material occurring during or as a result of activities of the holder or the holder's heirs, assigns, agents, employees, contractors, or lessees on, or related to, the lands, property, and other interests covered by this permit. For purposes of clause IV.F, "hazardous material" shall mean any hazardous substance, pollutant, contaminant, hazardous waste, oil, and/or petroleum product, as those terms are defined under any federal, state, or local laws or regulations.

E. INDEMNIFICATION. The holder shall indemnify, defend, and hold harmless the United States for any costs, damages, claims, liabilities, and judgments arising from past, present, and future acts or omissions of the holder in connection with the use and occupancy authorized by this permit. This indemnification and hold harmless provision includes but is not limited to acts and omissions of the holder or the holder's family, guests, invitees, heirs, assignees, agents, employees, contractors, or lessees in connection with the use and occupancy authorized by this permit which result in (1) violations of any laws and regulations which are now or which may become applicable; (2) judgments, claims, demands, penalties, or fees assessed against the United States; (3) costs, expenses, and damages incurred by the United States; or (4) the release or threatened release of any solid waste, hazardous waste, hazardous materials, pollutant, contaminant, oil in any form, or petroleum product into the environment. The authorized officer may prescribe terms that allow the holder to replace, repair, restore, or otherwise undertake necessary curative actions to mitigate damages in addition to or as an alternative to monetary indemnification.

F. CONTINUATION OF LIABLITY BEYOND EXPIRATION. The holder shall not be released from requirements of this permit until all outstanding obligations have been satisfied, regardless of whether the permit has expired.

V. PERMIT FEES

A. LAND USE FEE. The holder shall pay an annual land use fee of $30.00 for the period from September 26, 2011 to September 26, 2012 and thereafter annually on N/A, in the amount of N/A.

B. MODIFICATION OF THE LAND USE FEE. The land use fee may be revised whenever necessary to reflect the market value of the authorized use or when the fee system used to calculate the land use fee is modified or replaced.

C. TERMINATION FOR NONPAYMENT. This permit shall terminate without the necessity of prior notice and opportunity to comply when any permit fee payment is 90 calendar days from the due date in arrears. The holder shall be responsible for the delinquent fees, as well as any other costs of restoring the site to its original condition, including hazardous waste cleanup.

VI. REVOCATION, SUSPENSION, AND TERMINATION

A. REVOCATION AND SUSPENSION. The authorized officer may revoke or suspend this permit in whole or in part:

1. For noncompliance with federal, state or local law.
2. For noncompliance with the terms and conditions of this permit.
3. For abandonment or other failure of the holder to exercise the privileges granted.
4. With the consent of the holder.
5. For specific and compelling reasons in the public interest.

Prior to revocation or suspension, other than immediate suspension under clause C, the authorized officer shall give the holder written notice of the grounds for revocation or suspension. In the case of revocation or suspension based on clause

VI.A.1, 2, or 3, the authorized officer shall give the holder a reasonable period, not to exceed 90 days, to cure any noncompliance.

B. RELINQUISHMENT OF ARTIFACTS AND DOCUMENTS. Within 30 days of revocation or suspension of this permit, the holder shall deliver to the Forest Service all artifacts and originals of all photographs, negatives, catalogues, field notes, analysis sheets, reports in any stage of preparation, computer files, and any other records resulting from any activity conducted under this permit.

C. IMMEDIATE SUSPENSION. The authorized officer may immediately suspend this permit in whole or in part when necessary to protect public health or safety or the environment. The suspension decision shall be in writing. The holder may request an on-site review with the authorized officer's supervisor of the adverse conditions prompting the suspension. The authorized officer's supervisor shall grant this request within 48 hours. Following the on-site review, the authorized officer's supervisor shall promptly affirm, modify, or cancel the suspension.

D. APPEALS AND REMEDIES. Written decisions made by the authorized officer relating to administration of this permit are subject to appeal pursuant to 36 CFR Part 251, Subpart C, as amended. Revocation or suspension of this permit shall not give rise to any claim for damages by the holder against the Forest Service.

E. TERMINATION. This permit shall terminate when by its terms a fixed or agreed upon condition, event, or time occurs without any action by the authorized officer. Examples include but are not limited to expiration of the permit by its terms on a specified date. Termination of this permit is not subject to administrative appeal and shall not give rise to any claim for damages by the holder against the Forest Service.

VII. MISCELLANEOUS PROVISIONS

A. MEMBERS OF CONGRESS. No member of or delegate to Congress or Resident Commissioner shall benefit from this permit either directly or indirectly, except to the extent the authorized use provides a general benefit to a corporation.

B. SUPERIOR CLAUSES. If there is any conflict between any of the preceding clauses and any subsequent clauses or appendices, the preceding clauses shall control.

THIS PERMIT IS ACCEPTED SUBJECT TO ALL ITS TERMS AND CONDITIONS.

BEFORE ANY PERMIT IS ISSUED TO AN ENTITY, DOCUMENTATION MUST BE PROVIDED TO THE AUTHORIZED OFFICER OF THE AUTHORITY OF THE SIGNATORY FOR THE ENTITY TO BIND IT TO THE TERMS AND CONDITIONS OF THE PERMIT.

ACCEPTED:

Patrick Maxon, Director - Cultural Resources
BonTerra Consulting

HOLDER NAME, PRECEDED BY NAME AND TITLE OF PERSON SIGNING ON BEHALF OF HOLDER, IF HOLDER IS AN ENTITY	SIGNATURE	9/22/11 DATE

APPROVED:

Michael J. McIntyre NAME AND TITLE OF AUTHORIZED OFFICER District Ranger	SIGNATURE	9/28/11 DATE

Appendix A

Use Code: 411
Authorization ID: LAR 9040 CAI
Contact ID: Bon Terra

FS-2700-30 (Rev 05/06)
OMB No. 0596-0082

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE

APPLICATION FOR PERMIT FOR ARCHAEOLOGICAL INVESTIGATIONS

<USER NOTES FOR AUTHORITY>
<Select all authorities that apply. Delete any that do not apply.>

Authority:
Archaeological Resources Protection Act of 1979,
16 U.S.C. 470aa-mm

Antiquities Act of 1906,
16 U.S.C. 431-433

Organic Act of 1897
16 U.S.C. 551

Instructions: Complete and return two copies of this application form and required attachments to the appropriate Forest Service administrative unit. All information requested must be completed before the application will be considered. Use separate pages if more space is needed to complete a section.

1. Name of applicant (individual, institution, corporation, partnership, or other entity)
Patrick Maxon, RPA
BonTerra Consulting

2. Mailing address
151 Kalmus, E-200
Costa Mesa, Ca 92626

3. Telephone numbers
714-444-9199 (office)
949-677-2393 (mobile)

4. Email addresses
pmaxon@bonterraconsulting.com

5. Nature of archaeological work proposed

- [x] Survey and recordation
- [ ] Limited testing (shovel tests, scrapes, probes)
- [ ] Formal testing and/or surface collection (project-specific)
- [ ] Excavation and/or removal (project-specific)
- [ ] Conservation and protection, e.g., ruin stabilization, restoration, rock art conservation, ARPA damage assessments (project-specific)

6. Location of proposed work (attach additional sheets)

Project is in Los Angeles County with the majority of the project site on Angeles National Forest lands.

Project area is shown on the USGS 7.5 minute Condor Peak, CA quadrangle (1995); Township 2 and 3 North, Range 12 and 13 West, portions of Section 1 and unsectioned. A copy of the attachaed map showing the specific project area depicts the proposed survey area. The green polygon shows the non-public lands within the project area.

The Forest Service administrative unit is the Angeles National Forest Los Angeles River Ranger District

7. Duration of proposed work

Duration of entire project: From September 12, 2011 To September 12, 2012

Duration of fieldwork: 1 day of field work From 9/12/11 To 9/12/12

8. Principal investigator

Patrick Maxon

Principal investigator contact information
949-677-2393 (mobile)
pmaxon@bonterraconsulting.com

9. Field directors	**Field director contact information**
Patrick Maxon Albert Knight	**Maxon:** 714-444-9199 (office) 949-677-2393 (mobile) pmaxon@bonterraconsulting.com **Knight** 818-426-4730 (mobile) ahunknight@msn.com
10. Permit holder	**Permit holder contact information**
Patrick Maxon, RPA Name of individual who will be responsible for fulfilling the terms and conditions of the permit or who has authority to bind the entity applying for the permit to its terms and conditions.	Telephone numbers: 714-444-9199 (office) 949-677-2393 (mobile) Email addresses: pmaxon@bonterraconsulting.com

11. The applicant must attach the following to the application form:

a. A description of the purpose, nature, and extent of the work proposed, including how and why it is proposed to be conducted (include research design, methods, and curation).

b. A summary of support capabilities, including the location and a description of necessary facilities and equipment, the personnel to be involved in the proposed work, and, in the case of an applicant that is an entity, its organizational structure and staffing.

c. A summary of the applicant's experience in completing the kind of work proposed, including similar projects and government contracts and federal permits that were previously held, that are currently in force, with their effective dates, and that are pending or planned, by agency and region or state, reports or publications resulting from similar work, and any other pertinent experience.

d. For each individual named in blocks 8 and 9, a resume including education, training, and experience in the kind of work proposed and in the role proposed.

e. A written certification, signed by an authorized official of the proposed curatorial facility, attesting to the facility's capability and willingness to accept any collections, records, data, photographs, and other documents generated during the proposed permit term and to assume permanent curatorial responsibility for those materials on behalf of the United States Government pursuant to 36 CFR Part 79. Archaeological and historical artifacts excavated or removed from National Forest System lands and their associated documentation shall remain the property of the United States. Custody of any Native American human remains or cultural items subject to the Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3001-3013, that are removed from National Forest System lands shall be determined in accordance with NAGPRA and its implementing regulations at 43 CFR Part 10.

12. Proposed publications for results of work conducted under the permit

Section 106 compliant Cultural Resources Assessment report using Archaeological Resource Management Reports (ARMR) guidelines.

13. Signature of individual named in block 10	**14. Date signed**
Patrick Maxon	9/13/11

ARPA Permit Attachment

a. The County of Los Angeles Department of Public Works proposes to conduct the Big Tujunga Dam and Reservoir Sediment Removal Project, which involves the excavation of sediment within the Big Tujunga Reservoir (BTR) and the deposition of the sediment in the Maple Canyon Sediment Placement Site (SPS), located in Big Tujunga Canyon, Angeles National Forest. Excavations of up to 4.4 million cubic yards (mcy) of sediment would be conducted over an area of approximately 83 acres within the BTR. Maple Canyon SPS currently holds less than 2.5 mcy of sediment over an area of approximately 28 acres. The additional 4.4 mcy of sediment from this Project would cover a total area of 32 acres, including 22 acres of previously undeveloped area within the SPS.

   The purpose of the cultural resources study is to ensure that the proposed project does not adversely impact significant cultural resources. The study will consist of (1) records searches at the South Central Coastal Information Center at the California State University, Fullerton and the Forest Service Los Angeles River Ranger District office; (2) NAHC and Native American scoping; (3) a one-day pedestrian survey of the Area of Potential Effects (APE) by Patrick Maxon and/or Albert Knight; and (4) completion of a technical cultural resources report (following Archaeological Resource Management Report [ARMR] guidelines) that summarizes the findings of the study and offers management recommendations.

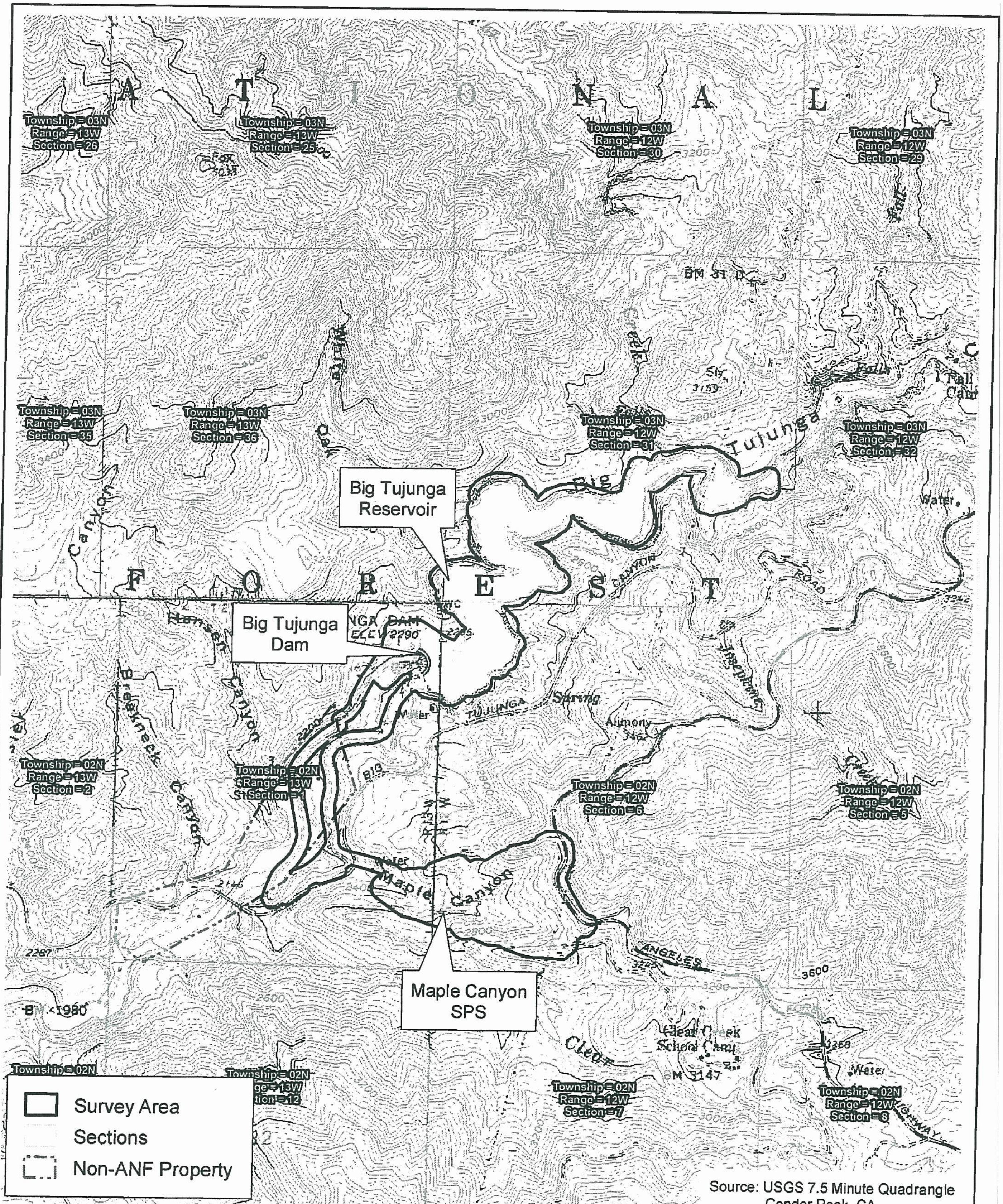
b. Patrick Maxon (Principal Investigator) and Albert Knight (Archaeology Field Director) will be involved in the study. They meet the Secretary of Interior's Professional Qualification Standards for Archaeology.

   BonTerra Consulting office support will consist of GIS capabilities to construct project maps, staff support, and computers for documentation purposes. No specialized equipment is necessary.

c. Mr. Maxon has completed scores of reconnaissance studies over the past 17 years. Mr. Maxon has held ARPA and other use Permits for the Forest Service, Bureau of Reclamation, and USACE; BLM use permits; and permits for the California Energy Commission. In 2010 a Forest Service archaeological investigation permit (LAR9036CRI) was issued to survey portions of Big Tujunga Canyon Road for the County of Los Angeles Department of Public Works (LADPW), and most recently in April 2011 a archaeological permit (LAR9039CRI) was acquired from the Forest Service for a sediment removal project by the LADPW at the Pacoima Reservoir.

d. Resumes for Patrick Maxon and Albert Knight are attached.

e. By agreement with the Angeles National Forest, no collections will be made. All items of historical or archaeological nature will be left in place within the Forest and remain property of the United States Government.



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U.S. Geological Survey 7.5-Minute Quadrangle

Big Tujunga Dam and Reservoir Post-Fire Sediment Removal Project

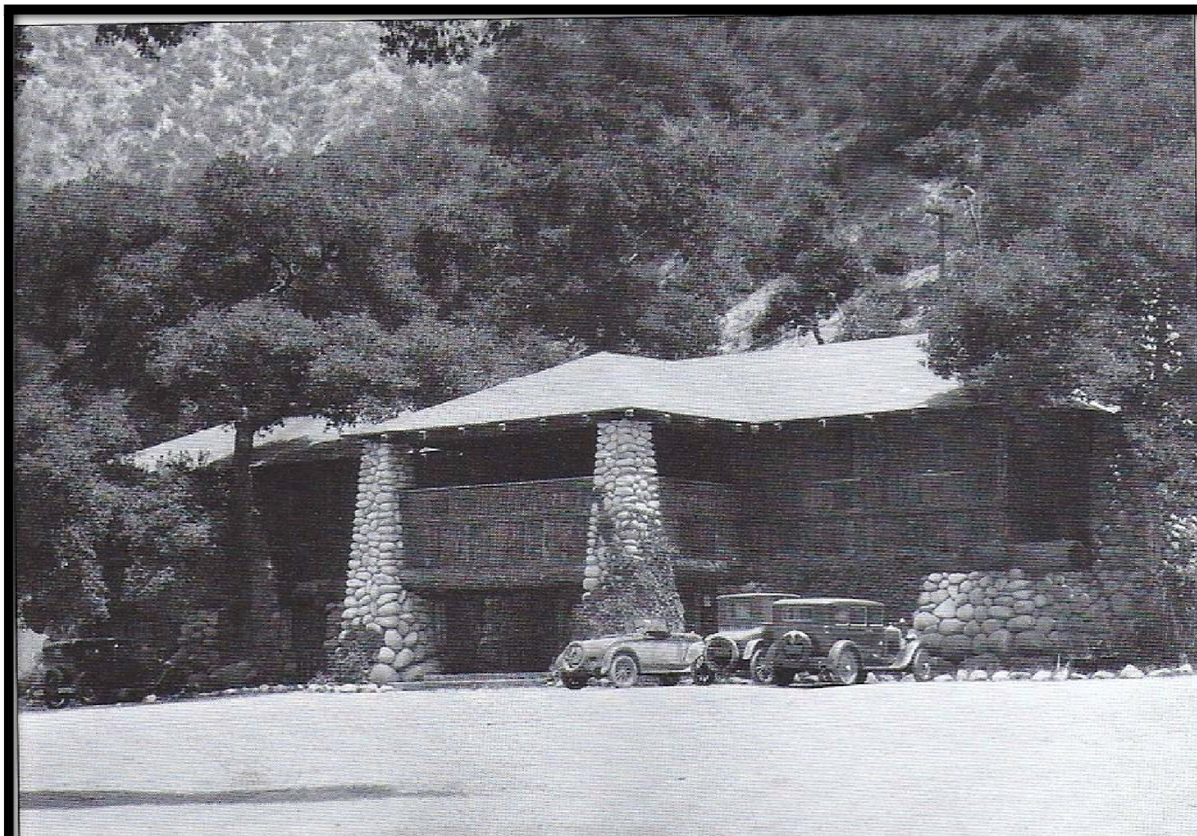
N E S W

2,000 1,000 0 2,000 Feet

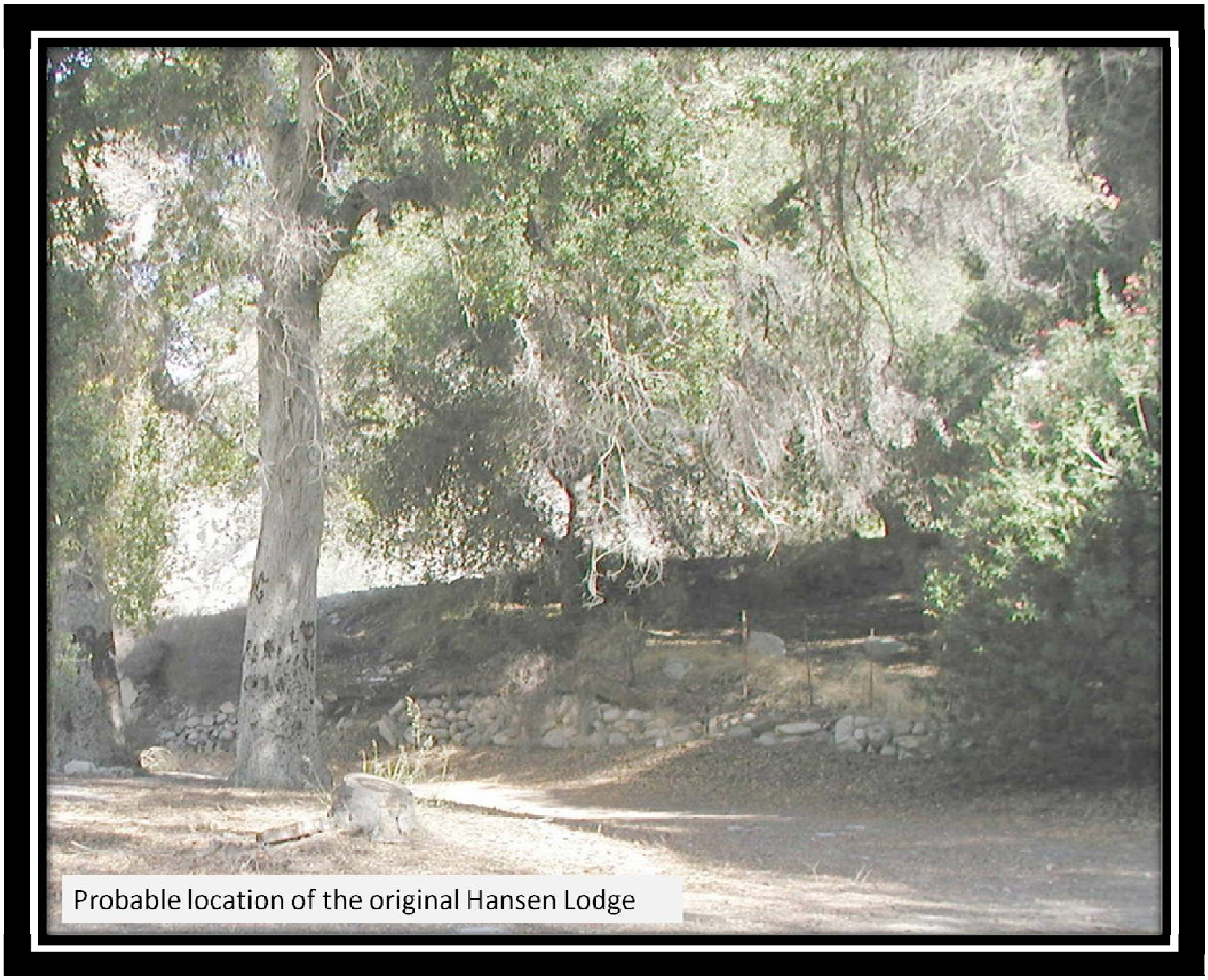
BonTerra CONSULTING

APPENDIX E

SITE PHOTOGRAPHS



TUJUNGA CANYON, 1931. Pictured in this photograph is the "Lodge" on the Hanson Ranch in Tujunga Canyon. The Hansen Ranch became a Los Angeles County Park and recreation area in July 1931. It had recreational facilities such as two tennis courts, a swimming pool, playground, picnicking tables, and camping spots. The Lodge was turned into a public clubhouse for parties and meetings. It was originally built as the ranch house for the Hansen family, and was constructed as a log cabin with a river-rock design that was common for the area.



Probable location of the original Hansen Lodge

Note Maple Canyon existing just missing the original ridgeline Edison pole line access road (186877)

APPENDIX F

PERSONNEL QUALIFICATIONS

Education

Master of Arts, Anthropology, California State University, Fullerton, CA, 1994

Bachelor of Arts, Psychology/Sociology, Towson State University, Maryland, Towson, MD, 1987

Professional Certifications

Registered Professional Archaeologist (National), ID # 11468, 1999–present

Certified Archaeologist, Orange County Environmental Management Agency, 1998–present

Certified Archaeologist, Riverside County Transportation and Land Management Agency, Register #226, 2008–present

Cultural Resources Specialist, California Energy Commission, 2004

Professional Summary

Patrick Maxon is a Registered Professional Archaeologist who is certified by the County of Orange and the Riverside County Transportation and Land Management Agency. He meets the Secretary of Interior's standards for historic preservation programs for archaeology and he has been previously certified as an Archaeologist by the City of San Diego and the California Energy Commission. Mr. Maxon has 17 years of experience in all aspects of cultural resources management, including prehistoric and historic archaeology, paleontology, ethnography, and tribal consultation. He has expertise in compliance with the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA), the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), and the Clean Water Act, among others. Mr. Maxon has completed hundreds of cultural resources projects that have involved (1) agency, client, Native American, and subcontractor coordination; (2) treatment plans and research design development; (3) archival research; (4) field reconnaissance; (5) site testing; (6) data recovery excavation; (7) construction monitoring; (8) site recordation; (9) site protection/preservation; (10) mapping/cartography; (11) laboratory analysis; and (12) report production. He has managed a number of projects within the jurisdiction of the U.S. Army Corps of Engineers (USACE), the Bureau of Land Management, the Bureau of Reclamation, and other federal agencies that require compliance with Section 106 of the NHPA. He has also completed projects throughout Southern California under CEQA for State and local governments and municipalities, including the California Department of Transportation (Caltrans), the Department of General Services (DGS), the California Energy Commission, the California Department of Water Resources, the Los Angeles County Department of Public Works (LADPW), the Los Angeles Department of Water and Power, the Los Angeles Unified School District, and others.

Representative Project Experience

Big Tujunga Canyon Road Repair Project Cultural Resources Services, Los Angeles County. Mr. Maxon served as the Cultural Resources Manager for the Big Tujunga Canyon Road Project in Los Angeles County, which consisted of stabilizing the road using a concrete gabion system. He completed a cultural resources literature review of the project site at the South Central Coastal Information Center (SCCIC) located at the California State University, Fullerton. The results of this research were used to help guide the subsequent field survey and were summarized in the Cultural Resources Phase 1 Report and an Archaeological Survey Report (ASR)/Historic Property Survey Report (HPSR) in accordance with Caltrans requirements. Mr. Maxon also contacted the California Native American Heritage Commission

(NAHC) for a review of their Sacred Lands File and obtained a list of Native American contacts for the project area then prepared and sent informational letters to all the NAHC-listed contacts in order to ensure a good-faith effort of participation. The project also entails (1) consideration of the historic significance of the road itself and a rock wall built on a portion of the shoulder and (2) preparation of a Historic Resources Evaluation Report (HRER) in accordance with Caltrans guidelines. Engineering problems with the project design have put the project on hold. No reports have been written to date.

Cobb Reservoir Cultural Resources Services, Altadena. Mr. Maxon served as the Cultural Resources Manager for the Cobb Reservoir Project in the Angeles National Forest. Mr. Maxon led the investigation to determine the project's impact on cultural resources and to determine the historic significance of the 1916-era Cobb Reservoir. The investigation included (1) a field visit of the project site; (2) compilation and analysis of existing research material (maps, aerial photographs, engineering documents, and technical journals); (3) review and implementation of relevant regulations that apply to the identification and surveying of historic properties; and (4) evaluation of the reservoir using federal and State significance criteria. A final historical resources assessment report described the study results and provided management recommendations. A set of California Department of Parks and Recreation (DPR) Historic Resources Inventory forms were produced for the subject property. The construction project consisted of improvements to the existing Cobb Reservoir, including roof, concrete footer, and perimeter fence replacement and surface drainage improvements.

Mullally Debris Basin Enlargement Project Cultural Resources Services, Los Angeles County. Mr. Maxon was the Cultural Resources Manager for the Mullally Debris Basin Enlargement Project. He conducted an archaeological/historic records search at the South Central Coastal Information Center (SCCIC) located at the California State University, Fullerton, which indicated that no prehistoric archaeological sites have been previously recorded and/or evaluated on the property; however, two historic sites have been recorded within one mile of the project area. A Sacred Lands File Search conducted by the Native American Heritage Commission (NAHC) did not indicate the presence of Native American cultural resources within a half-mile of the project area; however, there are resources in close proximity. The Mullally Debris Basin itself is less than 50 years old and therefore does not meet the basic requirements of a historic resource. Because the project area is not sensitive for cultural remains, no additional cultural resources studies are recommended. The proposed project involves the demolition of an existing crib structure dam at the Mullally Debris Basin and reconstruction of a new, larger dam structure. Construction activities would involve the demolition and removal of the existing structure, minor excavation of dam-adjacent hillsides to allow for the new dam, and dam construction.

Whittier Narrows Dam Basin Recreation Area Master Development Plan Input Program Environmental Impact Report, Los Angeles County. Mr. Maxon served as the Cultural Resources Manager for the preparation of a Program Environmental Impact Report (EIR) for the Master Development Plan Input (MDPI) document to the 1996 *Whittier Narrows Recreation Area (WNRA) Master Plan*. Mr. Maxon reviewed existing literature and completed the Cultural Resources Section for the project's EIR. The MDPI is intended to provide the USACE (which owns the 1,400-acre area) with a vision for the future of the Whittier Narrows Dam Basin Recreation Area (WNDBRA) that has evolved from the coordination and collaboration of interested stakeholders. The MDPI conceptually organizes the WNDBRA into six Planning Zones and one Conservation/Restoration Zone to define the types and intensity of recreational activities that are compatible with each other and with the underlying natural resource values of the site. Areas of special consideration include impacts to biological resources, traffic/circulation, hydrology/drainage, and recreation.

Ortega Highway Reservoir Project Cultural Resources Monitoring, Orange County. Mr. Maxon served as the Project Manager for the Santa Margarita Water District's (SMWD's) excavation of test pits and auger borings for its Planning Area 4 Reservoir on Ortega Highway. BonTerra Consulting archaeologists and paleontologists monitored all substantial excavations into the subsurface at this location. The Cretaceous Period (ca. 140 to 65 million years ago) geologic formation known as the Williams Formation is present throughout the subsurface of the project area. BonTerra Consulting monitors recovered several fossils during the study including plant and leaf impressions, a small crab, and several fragments of bone that could be dinosaur. Further study is necessary to identify and evaluate the discoveries and curate them in an appropriate museum facility.

Tujunga Spreading Grounds Enhancement Project Cultural Resources Study, City of Los Angeles. Mr. Maxon was the Cultural Resouces Manager for the Tujunga Spreading Grounds Enhancement Project. He conducted a cultural resources study, which consisted of (1) a records search undertaken at the South Central Coastal Information Center (SCCIC) located at the California State University, Fullerton; (2) consultation with the Native American Heritage Commission (NAHC); (3) a paleontological records search at the Natural History Museum of Los Angeles County; and (4) an assessment of the project's potential to adversely impact cultural resources, including recommendations for mitigating any adverse impacts to a less than significant level. The existing facility buildings and structures on the site will not be removed, and they do not appear to be of sufficient age to be considered historic; therefore, there would be no significant impacts to historic resources. Monitoring was recommended during excavations for new intake facilities and during expansion and deepening of the basins due to the potential to impact cultural resources. The proposed Tujunga Spreading Grounds Project consists, in part, of an alteration to the current intake facility; creation of a low-flow treatment area; installation of two new intake facilities; and reactivation, deepening, and/or combining of existing water basins to alleviate the migration of methane gas from the landfill to local residences (due to the presence of the Sheldon-Arleta landfill).

East Garden Grove-Wintersburg Channel Widening Project Phase I Cultural Resources Study, Orange County. Mr. Maxon was the Cultural Resources Project Manager for the East Garden Grove-Wintersburg Channel Widening Project. He conducted a Phase I cultural resources study to determine if the proposed channel widening would have the potential to impact cultural resources. The study included a literature review at the South Central Coastal Information Center (SCCIC) located at the California State University, Fullerton; a paleontological literature review at the Natural History Museum of Los Angeles County; a pedestrian survey of the Area of Potential Effects (APE); and completion of the CEQA IS/MND section describing the study results. Mr. Maxon also consulted with USACE regulators, Native American tribes and individuals, and a local Archaeologist who has extensive experience working in and around Bolsa Chica. Elements of the defunct Bolsa Chica Gun Club were identified in the wetlands, but it was determined that the channel work would have no impact on them. Channel recordation and construction monitoring were recommended.

Highland Reservoir Project Cultural Surveys, Yorba Linda. Mr. Maxon was the Project Manager for the cultural resources element of the CEQA documentation for the Highland Reservoir Project in Yorba Linda. The project involved a cultural resources study for the demolition of the existing Highland Reservoir and its replacement with two new reservoirs. The first phase of the cultural resources study consisted of a Phase I cultural resources survey that resulted in the identification of the Highland Reservoir (constructed in 1911) as eligible for listing in the National Register of Historic Places (NRHP). A recommendation to monitor grading around the reservoir and to formally document the structure and related elements to Historic American Engineering Record (HAER), Level II, standards was made. The second phase included the production of large-format photographs of the structure, collection of existing drawings of the structure held by the Yorba Linda Water District, and production of as-built drawings of the structure's roof trusses. During reservoir demolition, BonTerra Consulting conducted archaeological monitoring. No significant cultural resources were discovered.

Eagle Canyon Dam Project Cultural Resources Services, Riverside County. Mr. Maxon was the Cultural Resources Manager for the Eagle Canyon Dam Project. Mr. Maxon reviewed an existing Phase I assessment of the Eagle Canyon Dam project site, consulted with the Agua Caliente Band of Cahuilla Indians (a portion of the project site lies on the Band's reservation), and completed the cultural resources section of the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) being prepared for the project. No significant cultural resources were discovered, and the project was completed in compliance with Section 106 of the NHPA.

Palos Verdes Reservoir Project Literature Review, Palos Verdes. Mr. Maxon was the Cultural Resources Manager for the Palos Verdes Reservoir Project. He conducted a cultural resources literature review for the Palos Verdes Reservoir project to satisfy regulatory requirements related to the renewal of a USACE, Los Angeles District, CWA Section 404 permit, which required that a cultural resources review be conducted under Section 106 of the NHPA. Also, a literature review of known cultural resources sites and studies within a one-mile radius of the Palos Verdes Reservoir project site was conducted at the South Central Coastal Information Center (SCCIC) located at the California State University, Fullerton. This review revealed that no cultural resources are known to exist in the immediate study area; however, eight sites are recorded within a one-mile radius. Several of these sites are described as potential village sites and exhibit dark and deep middens with numerous artifacts including manos, metates, mortars, pestles, bowls, cogged stones, projectile points, stone tools, shell beads, chipping waste, and other artifacts. Burials were also noted at one site. Most, if not all of the sites have been destroyed by later development.

Affiliations and Committees

Pacific Coast Archaeological Society (PCAS)

Society for California Archaeology (SCA)

Society for American Archaeology (SAA)

Association of Environmental Professionals (AEP) (Board of Directors, 2005–present)

American Cultural Resources Association (ACRA)

Professional Experience

BonTerra Consulting, 2008–present

Chambers Group, 2006–2008

SWCA, 2001–2006 (SWCA acquired RMW)

RMW Paleo Associates, 1994–2001

Education

Doctor of Philosophy, Anthropology, University of California, Riverside, CA, 1979 (Ph.D. Dissertation: Late Prehistoric Human Ecology of the Northern Mohave Sink, San Bernardino County, CA)

Master of Arts, Anthropology, California State University, Fullerton, CA, 1972

Bachelor of Arts, Anthropology, California State University, Fullerton, CA, 1970

Professional Certifications

Registered Professional Archaeologist (National), ID # 12617, 1998–present

Representative Project Experience

Atlanta Avenue Widening Project Historic Property Survey Report/Extended Phase I Study, Huntington Beach. In 2010, Dr. Drover wrote the Extended Phase I (XPI) proposal for California Department of Transportation (Caltrans) approval for this project. After approval, he led the team in the completion of the XPI study that consisted of a subsurface archaeological excavation to evaluate archaeological site CA-ORA-149 within the Area of Potential Effects (APE). Additionally, he wrote the XPI report, which Caltrans submitted to the State Historic Preservation Officer for concurrence. The XPI study revealed that CA-ORA-149 site deposits do not exist within the project area; therefore, no construction monitoring is necessary.

Santa Paula Recycled Water Project Preliminary Pipeline Sizing Phases 1a and 1b Phase I Cultural Resources Assessment, Santa Paula. In 2010, Dr. Drover served as the Principal Investigator for this project. Eleven miles of proposed pipelines were surveyed and evaluated for CEQA Plus (similar to National Historic Preservation Act Section 106 evaluation). Full-time archaeological monitoring will be required when construction activities occur in the immediate vicinity of the Santa Paula Cemetery and at the possible location of the ethnohistoric village of *Mupu*, located within the City. An Integrated Cultural Resources Management Plan (ICRMP) must be completed and approved prior to project construction.

Susan Street North Off-Ramp Project, Archaeological Survey Report, Costa Mesa. In 2007, Dr. Drover was the Principal Investigator responsible for overseeing the survey for and preparation of the Archaeological Survey Report for the Susan Street North Off-Ramp Project. The report was submitted to Caltrans District 12 complete with negative results.

Newport Banning Ranch Archaeological Resource Assessment, Newport Beach. In 2009, Dr. Drover served as the Principal Investigator for the Newport Banning Ranch Project in Newport Beach. The Newport Banning Ranch project would allow for the development of up to 1,375 residential dwelling units; 75,000 square feet of commercial uses; a 75-room resort inn; and approximately 52 acres of public parks on a 401-acre site. Dr. Drover conducted test excavations of 11 sites. Results showed that three of the sites (CA-ORA-839, and CA-ORA-844B, and CA-ORA-906) were deemed eligible for listing on the National Register of Historic Places and California Register of Historical Resources. Site preservation or data recovery excavation is recommended for the sites.

Education

Bachelor of Arts in Anthropology – Dean's Honors List, University of California, Santa Barbara, 1983

Various Archaeology Extension Classes, UCLA 1988-2002

Current Professional Memberships and Affiliations

Mr. Knight is a member of the Archaeology Conservancy, the Malki Museum, the Autry National Center, the Santa Susana Mountains Park Association (Lifetime), the Little Landers Historical Society (Lifetime), and the Society for California Archaeology (Lifetime).

Professional Summary

Albert Knight worked on his first student dig in 1975 and has been performing archaeological and anthropological research since 1986. Mr. Knight has worked as a Field Technician, a Crew Chief, and a Field Director on his own and others' projects. He has excavated many units, has performed field surveys at numerous locations across much of Southern and Central California, and has performed some lab work. Mr. Knight has conducted records searches and historical research; has performed construction monitoring on many large and small projects; and has written a variety of papers, including short project reports and professional articles, a few of which have been published. Mr. Knight has also conducted paleontological monitoring and is well informed about the geography, geology, and biology of Southern and Central California.

Representative Project Experience

Lancaster Solar Farms, TetraTech. Mr. Knight completed cultural resources surveys for four proposed Solar Farm fields in Lancaster, California: Conditional Use Permits (CUP) 2B, 3, 4, and 5. The effort included completing parallel transits and close examination of vegetation free areas of a total of approximately 300 acres of open land in Lancaster. The survey resulted in the discovery of one historic ranch complex site in CUP 2B, which will subsequently be recorded and evaluated for significance. Aside from other scattered isolated finds, no other resources were noted. The dense vegetation across much of the area probably obscured the presence of others.

Kenter-Sunset Electrode Upgrade Project Archaeology Assessment, Encino. Mr. Knight was the Archaeological Field Surveyor for the City of Los Angeles Department of Water and Power's Sylmar-Kenter Electrode Upgrade Project. Mr. Knight conducted an archaeological assessment in Encino and at the Van Norman Reservoir. Mr. Knight examined the proposed project area and prepared a summary of the field notes, the photographs, and a photographic log. Several archaeological sites were identified and visited in the vicinity of the alignment, but none will suffer impacts as a result of the project as they will be avoided.

Big Tujunga Canyon Road Archaeological Surveys, Angeles National Forest. Mr. Knight served as the Archaeological Field Surveyor for this project, which included 450 feet of Big Tujunga Canyon Road in the Angeles National Forest (ANF) for the County of Los Angeles Department of Public Works. He conducted an archaeological assessment, performed a records check at the ANF Headquarters Heritage Resources Office in Arcadia, visited the proposed project location, walked portions of the proposed work area, made notes, photographed the area, and provided a summary of all work completed. No prehistoric resources were discovered as a result of the survey; however, Big Tujunga Canyon Road itself, and a rock wall extending along a portion of the road, were recognized as potentially historic and will be evaluated by an Architectural Historian.

Broad Beach Waterline Project Archaeological Monitoring, Malibu. Mr. Knight served as an Archaeological Monitor during the installation of a new water line in Broad Beach Road. Mr. Knight recovered around two dozen prehistoric artifacts related to archaeological site CA-LAN-114, which were cleaned and catalogued. All information was properly recorded using California Department of Parks and Recreation (DPR) 523 forms. After the artifacts were recorded and after consultation with the staff at BonTerra Consulting, Mr. Knight contacted the University of California, Los Angeles (UCLA) Fowler Museum of Cultural History, which curates artifacts from Southern California and which agreed to curate the artifacts recovered from the site. Mr. Knight also personally transferred the artifacts to UCLA.

Pilot Desalinization Plant Project Archaeological Monitoring, Long Beach. Mr. Knight served as the Archaeological Monitor for the Pilot Desalinization Plant Project. He coordinated with Native American (Gabrielino) and Paleontological Monitors and with project personnel. The monitors observed all excavation work, and monitoring results were reported to the Client.

Irwindale Materials Recovery Facility Archaeological Assessment, Valley County Water District, Irwindale. Mr. Knight served as the Archaeological Field Surveyor for this project and conducted an archaeological survey at the Irwindale Materials Recovery Facility. Mr. Knight examined the proposed project area and prepared a summary of the field notes, the photographs, and a photographic log. No significant cultural resources were discovered; however, monitoring for paleontological resources was recommended during deeper excavations.

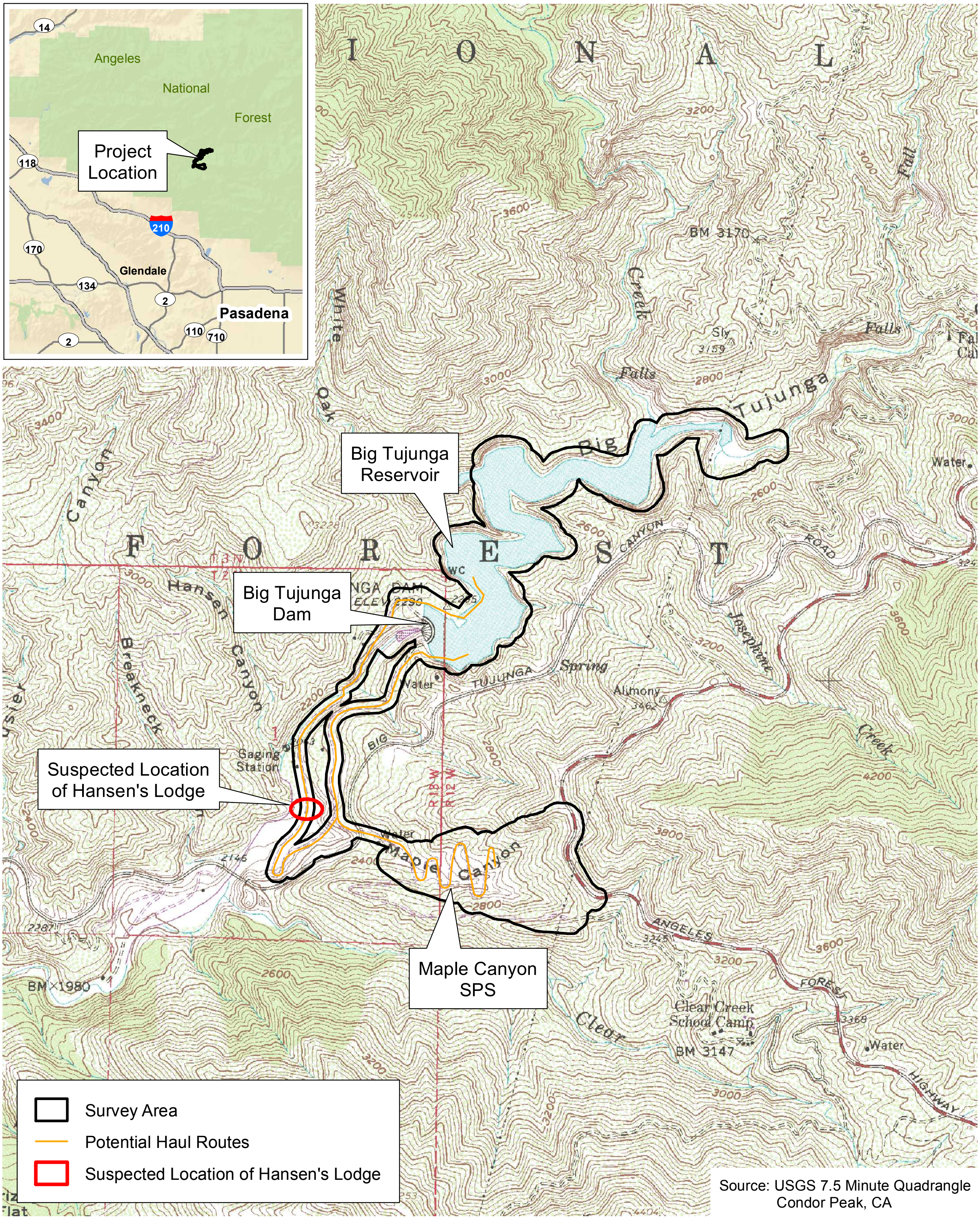
Mullally Canyon Debris Dam Archaeological Assessment, County of Los Angeles Department of Public Works. Mr. Knight served as the Archaeological Field Surveyor for an archaeological assessment at the Mullally Canyon Debris Dam. Mr. Knight examined the proposed project area and prepared a summary of the field notes, the photographs, and a photographic log. The Mullally Debris Basin was constructed in 1965 and therefore does not meet the minimum age requirements for evaluation as a historic resource. No other cultural resources were observed.

Thomas Roads Improvement Project Archaeological Assessment, Bakersfield. Mr. Knight served as one of two Archaeological Field Surveyors for this project, and conducted an archaeological assessment for the proposed Rosedale Highway (State Route 58)/State Route 99 Interchange Study. Over the course of three days, Mr. Knight examined the proposed project area and prepared a summary of the field notes, the photographs, and a photographic log. Because the vast majority of the project area is developed, no archaeological resources were expected or discovered. Monitoring was recommended in many areas, especially along the Kern River, which courses through the project area.

Baker Ranch Sites CA-ORA-1004 and CA-ORA-1150 Archaeological Excavations, Orange County. In 2009, Mr. Knight worked as an Archaeologist for two sites on Baker Ranch in Orange County. Mr. Knight directed the excavations of test units and shovel test pits, directed the field crew, recorded notes pertinent to the excavations, photographed the excavations, produced photographic logs, and monitored equipment. All work produced negative results.

CONFIDENTIAL APPENDIX G
NOT FOR PUBLIC REVIEW

HANSEN’S LODGE APPROXIMATE LOCATION



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Hansen's Lodge Approximate Location

Confidential Appendix G

Big Tujunga Reservoir Sediment Removal Project

N W E S

2,000 1,000 0 2,000 Feet

BonTerra CONSULTING

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