APPENDICES

Appendix A: Habitat Typing Methods

Appendix B: Gravel Permeability Methods

Appendix C: Habitat Typing Results (Tables)

APPENDIX A: HABITAT TYPING

CALIFORNIA SALMONID STREAM HABITAT RESTORATION MANUAL
California Dept. of Fish & Game

METHODS
Habitat inventories follow the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al, 1998). The field crews that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). Habitat inventories are conducted by a two-person team.

SAMPLING STRATEGY
The inventory uses a method that samples approximately 10% of the habitat units within the surveyed length. All habitat units included in the survey are classified according to habitat type and their lengths are measured. Habitat unit types encountered for the first time within a given channel type are fully measured for all the parameters and characteristics on the field form. Additionally, from the ten habitat units on each field form page, one is randomly selected for complete measurement. **Pool habitat is an especially critical feature within salmonid streams, and is therefore measured more frequently than random units. Approximately 33% (every third pool encountered) of pools are fully measured.**

HABITAT INVENTORY COMPONENTS
A standardized habitat inventory form has been developed for use in California stream surveys and can be found in the *California Salmonid Stream Habitat Restoration Manual*. There are eleven components to the inventory form.

1. Flow:
Flow is measured in cubic feet per second (cfs) near the bottom of the stream survey reach using a Marsh-McBirney Model 2000 flow meter. When not feasible due to low flow or budgetary constraints, flow is visually categorized as low, moderate, or high.

2. Channel Type:
Channel typing is conducted according to the classification system developed and revised by David Rosgen (1994). This methodology is described in the *California Salmonid Stream Habitat Restoration Manual*. Channel typing is conducted simultaneously with habitat typing and follows a standard form to record measurements and observations. There are five measured parameters used to determine channel type: 1) water slope gradient, 2) entrenchment, 3) width/depth ratio, 4) substrate composition, and 5) sinuosity. Channel characteristics are measured using a clinometer, hand level, hip chain, tape measure, and a stadia rod.

3. Temperatures:
Both water and air temperatures are measured and recorded at a minimum of every tenth habitat unit. The time of the measurement is also recorded. Both temperatures are taken in degrees Fahrenheit at the middle of the habitat unit and within one foot of the water surface.

4. Habitat Type:
Habitat typing uses the 24 habitat classification types defined by McCain and others (1990). Habitat units are numbered sequentially and assigned a type identification number selected from a standard list of 24 habitat types. Dewatered units are labeled "dry". Napa River basin habitat typing used standard basin level measurement criteria. These parameters require that the

minimum length of a described habitat unit must be equal to or greater than the stream's mean wetted width. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a clinometer, hip chain, and stadia rod.

5. Embeddedness:
The depth of embeddedness of the cobbles in pool tail-out areas is measured by the percent of the cobble that is surrounded or buried by fine sediment. In the survey, embeddedness is visually estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3) and 76 - 100% (value 4). Additionally, a value of 5 was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate like bedrock, log sills, boulders or other considerations.

6. Shelter Rating:
Instream shelter is composed of those elements within a stream channel that provide juvenile salmonids protection from predation, reduce water velocities so fish can rest and conserve energy, and allow separation of territorial units to reduce density related competition for prey. The shelter rating is calculated for each fully-described habitat unit by multiplying shelter value and percent cover. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All cover is then classified according to a list of nine cover types. A standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the cover. Thus, shelter ratings can range from 0-300 and are expressed as mean values by habitat types within a stream.

7. Substrate Composition:
Substrate composition ranges from silt/clay sized particles to boulders and bedrock elements. In all fully-described habitat units, dominant and sub-dominant substrate elements were visually estimated using a list of seven size classes and recorded as a one and two, respectively. In addition, the dominant substrate composing the pool tail-outs is recorded for each fully measured pool.

8. Canopy:
Stream canopy density was estimated using modified handheld spherical densiometers as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. An estimate of the percentage of the habitat unit covered by canopy was made from the center of approximately every third unit in addition to every fully-described unit, giving an approximate 30% sub-sample. In addition, the area of canopy was roughly categorized into percentages of coniferous or hardwood trees.

9. Bank Composition and Vegetation:
Bank composition elements range from bedrock to bare soil. However, the stream banks are usually covered with grass, brush, or trees. These factors influence the ability of stream banks to withstand winter flows. The dominant composition type and the dominant vegetation type of both the right and left banks for each fully-described unit were selected from the habitat inventory form. Additionally, the percent of each bank covered by vegetation (including downed trees, logs, and rootwads) was estimated and recorded.

10. Large Woody Debris Count:
Large woody debris (LWD) is an important component of fish habitat and an element in channel forming processes. In each fully measured habitat unit, all pieces of LWD partially or entirely below the elevation of bankfull discharge are counted and recorded. The minimum size to be

considered is twelve inches in diameter and six feet in length. The LWD count is presented by reach and is expressed as an average per 100 feet.

11. Average Bankfull Width:
Bankfull width can vary greatly in the course of a channel type stream reach. This is especially true in very long reaches. Bankfull width can be a factor in habitat components like canopy density, water temperature, and pool depths. Frequent measurements taken at riffle crests (velocity crossovers) are needed to accurately describe reach widths. At the first appropriate velocity crossover that occurs after the beginning of a new stream survey page (ten habitat units), bankfull width is measured and recorded in the appropriate header block of the page. These widths are presented as an average for the channel type reach.

DATA ANALYSIS

Data from the habitat inventory form are entered into Stream Habitat 2.0.3, a Visual Basic data entry program developed by Karen Wilson, Pacific States Marine Fisheries Commission in conjunction with the California Department of Fish and Game. This program processes and summarizes the data, and produces the following ten tables:

- Riffle, Flatwater, and Pool Habitat Types
- Habitat Types and Measured Parameters
- Pool Types
- Maximum Residual Pool Depths by Habitat Types
- Mean Percent Cover by Habitat Type
- Dominant Substrates by Habitat Type
- Mean Percent Vegetative Cover for Entire Stream
- Fish Habitat Inventory Data Summary by Stream Reach (Table 8)
- Mean Percent Dominant Substrate / Dominant Vegetation Type for Entire Stream
- Mean Percent Shelter Cover Types for Entire Stream

The following graphics are produced from the tables using Microsoft Excel:

- Riffle, Flatwater, Pool Habitat Types by Percent Occurrence
- Riffle, Flatwater, Pool Habitat Types by Total Length
- Total Habitat Types by Percent Occurrence
- Pool Types by Percent Occurrence
- Maximum Residual Depth in Pools
- Percent Embeddedness
- Mean Percent Cover Types in Pools
- Substrate Composition in Pool Tail-outs
- Mean Percent Canopy
- Dominant Bank Composition by Composition Type
- Dominant Bank Vegetation by Vegetation Type

GIS Field Name	Field Description
LLID	Unique stream identifier at confluence
SURVEYORS	Names of data collection team
CHANNELTYP	Channel type, Rosgen system
REACH	Stream reach number, starting at mouth
FLOW	Stream flow in cfs
DATESURVEY	Sample date in day/month/year
TIMESURVEY	Time of sample collection start
WATERTEMP	Water temperature in degrees Fahrenheit
AIRTEMP	Air temperature in degrees Fahrenheit
BFW	Bankfull width in feet measured every 10^{th} unit
FLGFULLSUR	Fully surveyed unit, 0 = false, 1 = true
HUNUMBER	Habitat unit no. starting at stream mouth
FLGMAINCHA	Main channel unit, 0 = false, 1 = true
HUTYPE	Habitat type as defined in manual
SIDECHANNE	Side channel habitat type
LENGTH	Length (ft) of each habitat type
FROM_	From downstream end of unit in feet
TO	To upstream end of unit in feet
MEANWIDTH	Mean width (ft) of each habitat unit
MEANDEPTH	Mean depth (ft) for each habitat unit
MAXDEPTH	Maximum depth (ft) for each habitat unit
LWDCOUNTSM	Number of smaller LWD pieces diameter > 1ft & length 6-20 ft
LWDCOUNTLA	Number of larger LWD pieces diameter > 1ft & length > 20 ft
DEPTHPOOLT	Depth of pool tailcrest (ft), pools only
POOLTAILEM	Measure cobble embeddedness 1-4
POOLTAILSU	Substrate of pool tailcrest (A through G), pools only
SHELTERVAL	Estimated shelter value per manual
PCT_COVER	% of unit providing fish cover
PCT_UNDERC	% cover provided by undercut banks
PCT_SWD	% cover provided by small woody debris
PCT_LWD	% cover provided by large woody debris
PCT_ROOT	% cover provided by root masses
PCT_TERRVE	% cover provided by terrestrial vegetation
PCT_AQUATI	% cover provided by aquatic vegetation
PCT_WHITEW	% cover provided by whitewater
PCT_BOULDE	% cover provided by boulders
PCT_BEDROC	% cover provided by bedrock ledges
SILTCLAYSU	Dominate substrate silt-clay
SANDSUB	Dominate substrate sand
GRAVELSUB	Dominate substrate gravel
SMALLCOBBL	Dominate substrate small cobble
LARGECOBBL	Dominate substrate large cobble
BOULDERSUB	Dominate substrate boulder
BEDROCKSUB	Dominate substrate bedrock
PCT_EXPOSE	% exposed substrate in unit
PCT_CANOPY	% vegetation canopy
PCT_DECIDO	% deciduous canopy
PCT_CONIFE	% coniferous canopy
RIGHTBANKC	Composition of right bank 1-4
RIGHTBANKD	Dominant vegetation on right bank (5-9)
PCT_RIGHTB	% right bank vegetative cover
LEFTBANKCO	Composition of left bank 1-4
LEFTBANKDO	Dominant vegetation on left bank (5-9)
PCT_LEFTBA	% left bank vegetative cover

Detailed Field Descriptions:

Channel Type - Record the channel type determined from completing the Stream Channel Type Work Sheet. Record in the comments the habitat unit number in which the channel type change occurs in.
Reach - Enter the reach number beginning with 1 for the lowermost channel type in the basin. Each stream channel type change proceeding upstream will be designated by a new stream reach number.
Flow Measurement - Record the flow at the beginning and the end of the survey, at the same location. Record in cubic feet/second.
Time - At the beginning of each page enter the time in military time (24-hour clock).
Water Temperature - At the beginning of each page record the water temperature to the nearest degree Fahrenheit. Water temperatures are taken in the middle of the habitat unit, within one foot of the water surface.
Air Temperature - At the beginning of each page record the air temperature to the nearest degree Fahrenheit. Air temperatures are taken in the middle of the habitat unit.
Habitat Unit Number - Enter the habitat unit number. Record these numbers in sequential order, beginning with "001" at the survey start. When numbering side channels begin with the number of the unit where the split or divide begins; use a new column and entirely fill it out for each subsequent side channel unit, and number the units sequentially adding a ".1", ".2", etc. as appropriate to describe the exact position of the side channel units. Example of a side channel with two habitat units:

Habitat Unit Number	005	006	006.1	006.2	007	008
Habitat Unit Type	5.3	1.1			4.2	1.2
Side Channel Type			1.1	3.2		

Habitat Unit Type - Determine the type of habitat unit and enter the appropriate habitat type number code. If the unit is dry, use 7.0 for the habitat unit type. If a stream length is contained within a culvert, use 8.0 for the habitat unit type. If the length of stream was not surveyed due to lack of access, use 9.0 for the habitat type. If the length of stream was not surveyed due to a marsh, use 9.1 for the habitat unit type. Record all pertinent information in the comments.
Side Channel Type - Determine the type of habitat unit and enter the appropriate habitat type number code.
Mean Length - Enter the thalweg length of the habitat unit, in feet.
Mean Width - Measure two or more wetted channel widths within the habitat unit. Calculate and enter the mean width for the habitat unit, in feet.
Mean Depth - Take several random depth measurements across the unit with a stadia rod. Calculate and enter the mean depth, in feet.
Maximum Depth - Enter the measured maximum depth for each habitat unit, in feet.
Depth Pool Tail Crest - Measure the maximum thalweg depth at the pool tail crest, in feet. This measurement is taken only in pool units and is used to determine the pool's residual volume.
Pool Tail Embeddedness - Percent cobble embeddedness is determined at pool tail-outs where spawning is likely to occur. Sample at least five small cobbles (2.5" to 5.0") in diameter and estimate the amount of the stone buried in the sediment. This is done by removing the cobble from the streambed and observing the line between the "shiny" buried portion and the duller exposed portion. Estimate the percent of the lower shiny portion using the corresponding number for the 25% ranges. Average the samples for a mean cobble embeddedness rating. Additionally, a value of 5 is assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate particle size, having a bedrock tail-out, or other considerations:
1 = 0 to 25%
2 = 26 to 50%
3 = 51 to 75%
4 = 76 to 100%
5 = unsuitable for spawning
Pool Tail Substrate - Enter the letter code (A through G) for the dominant substrate composition of the tail-out for all pools.
A) Silt/Clay
B) Sand (<0.08")
C) Gravel (0.08-2.5")

D) Sm. Cobble (2.5-5")
E) Lg. Cobble (5-10")
F) Boulder (>10")
G) Bedrock

Shelter Value - Enter the number code (0 to 3) that corresponds to the dominant structural shelter type that exists in the unit.

Value	Instream Shelter Complexity Value Examples:
0	- No shelter.
1	- One to five boulders. - Bare undercut bank or bedrock ledge. - Single piece of large wood (>12" diameter and 6' long) defined as large woody debris (LWD).
2	- One or two pieces of LWD associated with any amount of small wood (<12" diameter) defined as small woody debris (SWD). - Six or more boulders per 50 feet. - Stable undercut bank with root mass, and less than 12" undercut. - A single root wad lacking complexity. - Branches in or near the water. - Limited submersed vegetative fish cover. - Bubble curtain.
3	Combinations of (must have at least two cover types): - LWD/boulders/root wads. - Three or more pieces of LWD combined with SWD. - Three or more boulders combined with LWD/SWD. - Bubble curtain combined with LWD or boulders. - Stable undercut bank with greater than 12" undercut, associated with root mass or LWD. - Extensive submersed vegetative fish cover.

Percent Unit Covered - Enter the percentage of the unit occupied by the structural shelter. Classify 100 percent of the shelter by the types indicated on the form. Note: bubble curtain includes white water.
Substrate Composition - Enter a "1" for the dominant substrate and a "2" for the codominant substrate. Note: changes in the dominant and co-dominant substrate may indicate that the channel type has changed.
Percent Exposed Substrate - Enter the estimated percentage of the bottom substrate of the unit that is exposed above the water surface.
Percent Total Canopy - Enter the percentage of the stream area that is influenced by the tree canopy. The canopy is measured using a spherical densiometer at the center of each habitat unit.
Percent Deciduous Trees - Estimate the percent of the total canopy consisting of deciduous trees.
Percent Evergreen Trees - Estimate the percent of the total canopy consisting of evergreen trees.
Bank Composition - Observed at the bankfull discharge level. Enter the number (1 through 4) for the bank composition type. Banks are designated right or left when facing downstream.
1) Bedrock
2) Boulder
3) Cobble/Gravel
4) Silt/Clay/Sand

Bank Dominant Vegetation - Enter the number (5 through 9) for the bank dominant vegetation type, from bankfull to 20 feet upslope. Banks are designated right or left when facing downstream.
5) Grass
6) Brush
7) Deciduous Trees
8) Coniferous Trees
9) No Vegetation

Percent Bank Vegetated - Estimate the total percentage of the bank covered with vegetation from bankfull discharge level to 20 feet upslope. Banks are designated right or left when facing downstream

Habitat Type	*Abbreviation Code*	
RIFFLE		
Low Gradient Riffle	(LGR)	[1.1]
High Gradient Riffle	(HGR)	[1.2]
CASCADE		
Cascade	(CAS)	[2.1]
Bedrock Sheet	(BRS)	[2.2]
FLATWATER		
Pocket Water	(POW)	[3.1]
Glide	(GLD)	[3.2]
Run	(RUN)	[3.3]
Step Run	(SRN)	[3.4]
Edgewater	(EDW)	[3.5]
MAIN CHANNEL POOLS		
Trench Pool	(TRP)	[4.1]
Mid-Channel Pool	(MCP)	[4.2]
Channel Confluence Pool	(CCP)	[4.3]
Step Pool	(STP)	[4.4]
SCOUR POOLS		
Corner Pool	(CRP)	[5.1]
Lateral Scour Pool - Log Enhanced	(LSL)	[5.2]
Lateral Scour Pool - Root Wad Enhanced	(LSR)	[5.3]
Lateral Scour Pool - Bedrock Formed	(LSBk)	[5.4]
Lateral Scour Pool - Boulder Formed	(LSBo)	[5.5]
Plunge Pool	(PLP)	[5.6]
BACKWATER POOLS		
Secondary Channel Pool	(SCP)	[6.1]
Backwater Pool - Boulder Formed	(BPB)	[6.2]
Backwater Pool - Root Wad Formed	(BPR)	[6.3]
Backwater Pool - Log Formed	(BPL)	[6.4]
Dammed Pool	(DPL)	[6.5]
ADDITIONAL UNIT DESIGNATIONS		
Dry	(DRY)	[7.0]
Culvert	(CUL)	[8.0]
Not Surveyed	(NS)	[9.0]
Not Surveyed due to a marsh	(MAR)	[9.1]

APPENDIX B: SPAWNING GRAVEL PERMEABILITY

Source: NAPA RIVER WATERSHED LIMITING FACTORS ANALYSIS
APPENDIX 8: PERMEABILITY
Stillwater Sciences

To determine the quality of streambed gravels for salmonid egg incubation and larval (alevin) rearing, substrate permeability was measured using a modified Mark IV standpipe (Terhune 1958, Barnard and McBain 1994). Gravels at potential spawning sites were mixed to a depth of 0.95 feet to simulate mixing and sorting conditions that would occur during redd construction by a spawning salmonid (see Kondolf and Wolman 1993 for more information on this topic).

The standpipe used was 46.5 inches (118 cm) long, with a 1.0 inch (2.5 cm) inside diameter and a 1.25 inch (3.8 cm) outside diameter. The standpipe had a 2.75 inch-long band of perforations and was driven into the substrate so that the band of perforations extended in depth from approximately 0.64 to 0.86 feet below the bed surface. To reduce the potential for water 'slippage' down the pipe, the standpipe was held, but not forced in any direction, during the driving process.

Permeability was measured by using a Thomas vacuum pump (Model 107CDC20, powered by a 12-volt rechargeable battery) to siphon water out of the standpipe to maintain the water level inside the standpipe exactly one-inch lower than the surrounding water. By measuring the volume of water siphoned out of the standpipe over a measured time interval, it was thus possible to determine the recharge rate of the water level in the standpipe under a standard one-inch pressure head. At each spawning patch assessed, the standpipe was driven in twice and at least five consecutive permeability measurements were taken.

The recharge rate (units of volume per time) data measured in the field were converted into permeability (units of length per time) using an empirically derived rating table (Barnard and McBain 1994) and adjusted with a correction factor that accounts for temperature related changes in water viscosity that can affect permeability results (Barnard and McBain 1994).

Spawning gravel is manually cleaned to a depth of ~ 0.95 feet prior to driving in the standpipe to simulate the cleaning effect of redd construction.

Standpipe driven into the bed of the Napa River

APPENDIX C: HABITAT TYPING RESULTS TABLES

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Browns Creek **LLID:** 1223123383048 **Drainage:** Napa River

Survey Dates: 10/10/2006 to 11/27/2006

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:18:17.0N **Longitude:** 122:18:44.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
4	0	DRY	1.4	29	116	0.7									
82	6	FLATWATER	28.4	56	4557	29.1	7.7	0.5	0.9	362	29657	220	18009		14
1	0	NOSURVEY	0.3	2435	2435	15.6									
94	33	POOL	32.5	42	3981	25.4	10.3	1.0	2.0	476	44757	696	65382	596	52
108	6	RIFFLE	37.4	42	4558	29.1	6.2	0.3	0.5	318	34326	79	8494		9

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Browns Creek **LLID:** 1223123383048 **Drainage:** Napa River

Survey Dates: 10/10/2006 to 11/27/2006

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:18:17.0N **Longitude:** 122:18:44.0W

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
289	45	15647	108739	91885

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Browns Creek **LLID:** 1223123383048 **Drainage:** Napa River

Survey Dates: 10/10/2006 to 11/27/2006

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:18:17.0N **Longitude:** 122:18:44.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
105	5	LGR	36.3	42	4419	28.2	5.0	0.2	0.8	348	36582	78	8177		11	94
1	0	HGR	0.3	25	25	0.2										
2	1	BRS	0.7	57	114	0.7	11.0	0.5	0.8	165	330	83	165		0	96
82	6	GLD	28.4	56	4557	29.1	8.0	0.5	1.5	362	29657	220	18009		14	90
2	2	TRP	0.7	72	144	0.9	12.0	2.9	6.8	983	1965	3283	6566	3126	55	100
52	18	MCP	18.0	45	2340	15.0	12.0	0.9	3.0	487	25310	552	28688	481	44	91
3	3	STP	1.0	41	124	0.8	8.0	1.1	2.8	310	931	348	1045	304	50	62
19	5	CRP	6.6	43	823	5.3	7.0	0.7	3.2	389	7383	563	10699	307	50	95
2	0	LSL	0.7	27	54	0.3										
11	3	LSR	3.8	29	315	2.0	9.0	0.8	2.6	264	2908	278	3060	234	93	92
2	1	LSBk	0.7	62	125	0.8	11.0	1.1	3.2	1122	2244	1346	2693	1234	60	92
3	1	PLP	1.0	19	56	0.4	11.0	2.0	3.0	198	594	416	1247	396	90	86
4	0	DRY	1.4	29	116	0.7										80
1	0	NS	0.3	2435	2435	15.6										

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
289	45	15647	107903	80348

Table 3 - Summary of Pools

Stream Name: Browns Creek **LLID:** 1223123383048 **Drainage:** Napa River

Survey Dates: 10/10/2006 to 11/27/2006

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:18:17.0N **Longitude:** 122:18:44.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq. ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid. Vol (cu.ft.)	Mean Shelter Rating
57	23	MAIN	61	46	2608	66	11.2	1.1	507	28888	688	39199	46
37	10	SCOUR	39	37	1373	34	8.3	0.9	406	15007	387	14307	68

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
94	33	3981	43895	53506

Table 4 - Summary of Maximum Residual Pool Depths By Pool

Stream Name: Browns Creek **LLID:** 1223123383048 **Drainage:** Napa River

Survey Dates: 10/10/2006 to 11/27/2006

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:18:17.0N **Longitude:** 122:18:44.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
18	MCP	55	2	11	10	56	5	28	1	6	0	0
1	LSBk	3	0	0	0	0	0	0	1	100	0	0
5	CRP	15	1	20	3	60	0	0	1	20	0	0
2	TRP	6	0	0	0	0	0	0	1	50	1	50
3	STP	9	0	0	1	33	2	67	0	0	0	0
3	LSR	9	0	0	2	67	1	33	0	0	0	0
1	PLP	3	0	0	0	0	0	0	1	100	0	0
0	LSL	0	0	0	0	0	0	0	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1<2 Feet Max Resid. Depth	Total 1< 2 Feet % Occurrence	Total 2<3 Feet Max Resid. Depth	Total 2< 3 Feet % Occurrence	Total 3<4 Feet Max Resid. Depth	Total 3< 4 Feet % Occurrence	Total >=4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
33	3	9	16	48	8	24	5	15	1	3

Mean Maximum Residual Pool Depth (ft.): 2

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Browns Creek **LLID:** 1223123383048 **Drainage:** Napa River

Survey Dates: 10/10/2006 to 11/27/2006

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:18:17.0N **Longitude:** 122:18:44.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
105	5	LGR	0	0	0	24	0	0	2	54	0
1	0	HGR									
2	1	BRS	0	0	0	0	0	0	0	0	0
82	6	GLD	18	0	0	30	0	0	0	35	0
2	2	TRP	25	0	0	0	0	0	0	40	35
52	18	MCP	9	13	10	25	10	0	0	18	3
3	3	STP	8	0	0	8	8	0	10	32	33
19	5	CRP	35	16	4	5	8	0	0	18	14
2	0	LSL									
11	3	LSR	17	17	0	30	27	3	0	7	0
2	1	LSBk	0	10	0	70	0	0	0	0	20
3	1	PLP	50	20	0	20	10	0	0	0	0
1	0	NS									

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Browns Creek **LLID:** 1223123383048 **Drainage:** Napa River

Survey Dates: 10/10/2006 to 11/27/2006

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:18:17.0N **Longitude:** 122:18:44.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
105	5	LGR	0	0	40	60	0	0	0
1	0	HGR	0	0	0	0	0	0	0
2	1	BRS	0	0	0	0	0	0	100
82	6	GLD	17	0	67	17	0	0	0
2	2	TRP	0	0	0	0	0	0	100
52	18	MCP	39	44	17	0	0	0	0
3	3	STP	0	0	33	0	0	0	67
19	5	CRP	20	40	40	0	0	0	0
2	0	LSL	0	0	0	0	0	0	0
11	3	LSR	33	33	33	0	0	0	0
2	1	LSBk	100	0	0	0	0	0	0
3	1	PLP	0	100	0	0	0	0	0
1	0	NS	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Browns Creek **LLID:** 1223123383048 **Drainage:** Napa River

Survey Dates: 10/10/2006 to 11/27/2006

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:18:17.0N **Longitude:** 122:18:44.0W

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
91	78	22	0	64	67

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Browns Creek LLID: 1223123383048 Drainage: Napa River
Survey Dates: 10/10/2006 to 11/27/2006 Survey Length (ft.): 15647 Main Channel (ft.): 15647 Side Channel (ft.): 0
Confluence Location: Quad: NAPA Legal Description: T000R000S00 Latitude: 38:18:17.0N Longitude: 122:18:44.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: F4
Reach Length (ft.): 1010
Riffle/Flatwater Mean Width (ft.): 9.5
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs): 1
Water (F): 52 - 52 Air (F): 64 - 64
Dry Channel (ft.): 0

Canopy Density (%): 93.4
Coniferous Component (%): 97.8
Hardwood Component (%): 2.2
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 48.6
Dominant Shelter: Root masses
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 10.0
LWD per 100 ft.:
Riffles: 0
Pools: 1
Flat: 0

Pools by Stream Length (%): 45.8
Pool Frequency (%): 41.2
Residual Pool Depth (%):
< 2 Feet Deep: 40.0
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 60.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 2.27
Mean Pool Shelter Rating: 48

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 40.0 Sm Cobble: 60.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 40.0 2. 40.0 3. 0.0 4. 20.0 5. 0.0

STREAM REACH: 2

Channel Type: F4
Reach Length (ft.): 2756
Riffle/Flatwater Mean Width (ft.): 11.0
BFW:
Range (ft.): 28 to 28
Mean (ft.): 28
Std. Dev.: 0
Base Flow (cfs): 1
Water (F): 52 - 52 Air (F): 46 - 64
Dry Channel (ft.): 0

Canopy Density (%): 89.6
Coniferous Component (%): 71.4
Hardwood Component (%): 28.6
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 56.8
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Bedrock
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 41.7
Pool Frequency (%): 40.0
Residual Pool Depth (%):
< 2 Feet Deep: 11.1
2 to 2.9 Feet Deep: 66.7
3 to 3.9 Feet Deep: 11.1
>= 4 Feet Deep: 11.1
Mean Max Residual Pool Depth (ft.): 3.015
Mean Pool Shelter Rating: 52

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 10.0 Gravel: 50.0 Sm Cobble: 10.0 Lg Cobble: 0.0 Boulder: 20.0 Bedrock: 10.0
Embeddedness Values (%): 1. 27.3 2. 18.2 3. 0.0 4. 18.2 5. 36.4

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: F4
Reach Length (ft.): 2718
Riffle/Flatwater Mean Width (ft.): 8.7
BFW:
Range (ft.): 28 to 28
Mean (ft.): 28
Std. Dev.: 0
Base Flow (cfs): 0.5
Water (F): 52 - 53 Air (F): 54 - 57
Dry Channel (ft.): 0

Canopy Density (%): 91.5
Coniferous Component (%): 59.4
Hardwood Component (%): 40.6
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 74.7
Dominant Shelter: Root masses
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 3.8
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 42.0
Pool Frequency (%): 37.9
Residual Pool Depth (%):
< 2 Feet Deep: 60.0
2 to 2.9 Feet Deep: 40.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.81
Mean Pool Shelter Rating: 66

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 100.0 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 20.0 2. 40.0 3. 0.0 4. 40.0 5. 0.0

STREAM REACH: 4

Channel Type: NA
Reach Length (ft.): 2435
Riffle/Flatwater Mean Width (ft.):
BFW:
Range (ft.): to
Mean (ft.):
Std. Dev.:
Base Flow (cfs):
Water (F): 0 - 0 Air (F): 0 - 0
Dry Channel (ft.): 0

Canopy Density (%):
Coniferous Component (%):
Hardwood Component (%):
Dominant Bank Vegetation:
Vegetative Cover (%): 0.0
Dominant Shelter:
Dominant Bank Substrate Type:
Occurrence of LWD (%):
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 0.0
Pool Frequency (%): 0.0
Residual Pool Depth (%):
< 2 Feet Deep:
2 to 2.9 Feet Deep:
3 to 3.9 Feet Deep:
>= 4 Feet Deep:
Mean Max Residual Pool Depth (ft.):
Mean Pool Shelter Rating:

Pool Tail Substrate (%): Silt/Clay: Sand: Gravel: Sm Cobble: Lg Cobble: Boulder: Bedrock:
Embeddedness Values (%): 1. 2. 3. 4. 5. 0.0

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 5

Channel Type: F4
Reach Length (ft.): 6728
Riffle/Flatwater Mean Width (ft.): 4.5
BFW:
Range (ft.): 14 to 31.8999
Mean (ft.): 25.1042944785276
Std. Dev.: 5.04666991817136
Base Flow (cfs): 0.5
Water (F): 46 - 52 Air (F): 46 - 52
Dry Channel (ft.): 116

Canopy Density (%): 90.7
Coniferous Component (%): 83.8
Hardwood Component (%): 16.2
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 72.3
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 5.0
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 18.2
Pool Frequency (%): 27.6
Residual Pool Depth (%):
< 2 Feet Deep: 92.9
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 7.1
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.410
Mean Pool Shelter Rating: 49

Pool Tail Substrate (%): Silt/Clay: 14.3 Sand: 28.6 Gravel: 57.1 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 0.0 2. 14.3 3. 21.4 4. 64.3 5. 0.0

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Browns Creek **LLID:** 1223123383048 **Drainage:** Napa River

Survey Dates: 10/10/2006 to 11/27/2006

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:18:17.0N **Longitude:** 122:18:44.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	5	10	16.7
Boulder	6	1	7.8
Cobble/Gravel	4	12	17.8
Sand/Silt/Clay	30	22	57.8

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Grass	1	0	1.1
Brush	22	28	55.6
Hardwood Trees	9	5	15.6
Coniferous Trees	10	10	22.2
No Vegetation	3	2	5.6

Total Stream Cobble Embeddedness Values: 3

Table 10 - Mean Percent of Shelter Cover Types For Entire System

Stream Name: Browns Creek **LLID:** 1223123383048 **Drainage:** Napa River

Survey Dates: 10/10/2006 to 11/27/2006

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:18:17.0N **Longitude:** 122:18:44.0W

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	18	15
SMALL WOODY DEBRIS (%)	0	0	12
LARGE WOODY DEBRIS (%)	0	0	6
ROOT MASS (%)	20	30	21
TERRESTRIAL VEGETATION (%)	0	0	10
AQUATIC VEGETATION (%)	0	0	0
WHITEWATER (%)	2	0	1
BOULDERS (%)	45	35	19
BEDROCK LEDGES (%)	0	0	10

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Huichica Creek **LLID:** 1223492381925 **Drainage:** Napa River

Survey Dates: 10/5/2007 to 10/9/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T04NR04WS18 **Latitude:** 38:11:33.0N **Longitude:** 122:20:57.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
6	0	DRY	4.9	76	456	4.8									
38	5	FLATWATER	31.1	67	2528	26.7	7.1	0.4	0.7	469	17811	199	7551		19
2	0	NOSURVEY	1.6	1490	2979	31.5									
1	0	NOSURVEY_ MARSH	0.8	128	128	1.4									
41	17	POOL	33.6	46	1906	20.1	9.5	0.8	1.5	426	17485	451	18479	379	78
34	6	RIFFLE	27.9	43	1469	15.5	5.8	0.3	0.6	304	10333	112	3164		8

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Huichica Creek **LLID:** 1223492381925 **Drainage:** Napa River

Survey Dates: 10/5/2007 to 10/9/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T04NR04WS18 **Latitude:** 38:11:33.0N **Longitude:** 122:20:57.0W

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
122	28	9466	45629	29194

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Huichica Creek **LLID:** 1223492381925 **Drainage:** Napa River

Survey Dates: 10/5/2007 to 10/9/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T04NR04WS18 **Latitude:** 38:11:33.0N **Longitude:** 122:20:57.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
30	4	LGR	24.6	46	1370	14.5	7.0	0.3	1.0	381	11438	113	3377		11	96
4	2	BRS	3.3	25	99	1.0	4.0	0.4	0.7	149	597	108	216		0	95
12	2	GLD	9.8	48	571	6.0	10.0	0.4	0.9	348	4170	158	1894		8	100
3	1	RUN	2.5	35	105	1.1	4.0	0.3	0.7	132	396	40	119		0	100
23	2	SRN	18.9	81	1852	19.6	6.0	0.4	0.7	758	17440	319	7341		40	100
2	2	TRP	1.6	60	119	1.3	6.0	0.8	1.6	366	732	315	630	267	55	98
33	12	MCP	27.0	43	1416	15.0	9.0	0.8	3.2	476	15722	522	17240	440	82	98
4	1	STP	3.3	82	330	3.5	4.0	0.7	1.1	240	960	240	960	168	40	87
1	1	LSR	0.8	26	26	0.3	6.0	0.4	0.6	156	156	78	78	62	140	97
1	1	PLP	0.8	15	15	0.2	27.0	1.0	2.3	405	405	446	446	405	50	77
6	0	DRY	4.9	76	456	4.8										
2	0	NS	1.6	1490	2979	31.5										
1	0	MAR	0.8	128	128	1.4										

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
122	28	9466	52015	32300

Table 3 - Summary of Pools

Stream Name: Huichica Creek **LLID:** 1223492381925 **Drainage:** Napa River

Survey Dates: 10/5/2007 to 10/9/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T04NR04WS18 **Latitude:** 38:11:33.0N **Longitude:** 122:20:57.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq. ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid. Vol (cu.ft.)	Mean Shelter Rating
39	15	MAIN	95	48	1865	98	8.6	0.8	446	17391	399	15542	75
2	2	SCOUR	5	21	41	2	16.5	0.7	281	561	234	467	95

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
41	17	1906	17952	16009

Table 4 - Summary of Maximum Residual Pool Depths By Pool

Stream Name: Huichica Creek **LLID:** 1223492381925 **Drainage:** Napa River

Survey Dates: 10/5/2007 to 10/9/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T04NR04WS18 **Latitude:** 38:11:33.0N **Longitude:** 122:20:57.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
12	MCP	71	0	0	10	83	1	8	1	8	0	0
1	STP	6	0	0	1	100	0	0	0	0	0	0
2	TRP	12	0	0	2	100	0	0	0	0	0	0
1	PLP	6	0	0	0	0	1	100	0	0	0	0
1	LSR	6	1	100	0	0	0	0	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1<2 Feet Max Resid. Depth	Total 1< 2 Feet % Occurrence	Total 2<3 Feet Max Resid. Depth	Total 2< 3 Feet % Occurrence	Total 3<4 Feet Max Resid. Depth	Total 3< 4 Feet % Occurrence	Total >=4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
17	1	6	13	76	2	12	1	6	0	0

Mean Maximum Residual Pool Depth (ft.): 2

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Huichica Creek **LLID:** 1223492381925 **Drainage:** Napa River

Survey Dates: 10/5/2007 to 10/9/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T04NR04WS18 **Latitude:** 38:11:33.0N **Longitude:** 122:20:57.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
30	4	LGR	0	0	0	6	20	5	0	19	0
4	2	BRS	0	0	0	0	0	0	0	0	0
12	2	GLD	0	0	0	50	50	0	0	0	0
3	1	RUN	0	0	0	0	0	0	0	0	0
23	2	SRN	0	0	0	0	0	25	0	75	0
2	2	TRP	0	5	0	53	0	5	0	18	20
33	12	MCP	6	9	3	30	4	11	0	35	3
4	1	STP	0	0	0	20	0	45	35	0	0
1	1	LSR	0	0	0	80	10	0	0	10	0
1	1	PLP	0	0	0	0	0	100	0	0	0
2	0	NS									
1	0	MAR									

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Huichica Creek **LLID:** 1223492381925 **Drainage:** Napa River

Survey Dates: 10/5/2007 to 10/9/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T04NR04WS18 **Latitude:** 38:11:33.0N **Longitude:** 122:20:57.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
30	4	LGR	0	0	0	25	25	25	25
4	2	BRS	0	0	0	0	0	0	100
12	2	GLD	0	0	0	0	0	0	100
3	1	RUN	0	0	0	0	0	0	100
23	2	SRN	0	0	100	0	0	0	0
2	2	TRP	0	0	0	0	0	0	100
33	12	MCP	33	0	58	0	8	0	0
4	1	STP	0	0	0	0	0	0	100
1	1	LSR	0	0	100	0	0	0	0
1	1	PLP	0	0	0	0	0	0	100
2	0	NS	0	0	0	0	0	0	0
1	0	MAR	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Huichica Creek **LLID:** 1223492381925 **Drainage:** Napa River

Survey Dates: 10/5/2007 to 10/9/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T04NR04WS18 **Latitude:** 38:11:33.0N **Longitude:** 122:20:57.0W

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
97	0	100	0	66	62

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Huichica Creek LLID: 1223492381925 Drainage: Napa River
Survey Dates: 10/5/2007 to 10/9/2007 Survey Length (ft.): 9466 Main Channel (ft.): 9466 Side Channel (ft.): 0
Confluence Location: Quad: SONOMA Legal Description: T04NR04WS18 Latitude: 38:11:33.0N Longitude: 122:20:57.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type:
Reach Length (ft.): 3487
Riffle/Flatwater Mean Width (ft.): 7.7
BFW:
Range (ft.): 39.5 to 39.5
Mean (ft.): 39.5
Std. Dev.: 0
Base Flow (cfs): 0.1
Water (F): 52 - 55 Air (F): 64 - 66
Dry Channel (ft.): 95

Canopy Density (%): 96.2
Coniferous Component (%): 0.0
Hardwood Component (%): 100.0
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 61.5
Dominant Shelter: Root masses
Dominant Bank Substrate Type: Bedrock
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 6.1
Pool Frequency (%): 25.0
Residual Pool Depth (%):
< 2 Feet Deep: 50.0
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 50.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 2.45
Mean Pool Shelter Rating: 63

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 50.0 Sm Cobble: 0.0 Lg Cobble: 50.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 0.0 2. 50.0 3. 50.0 4. 0.0 5. 0.0

STREAM REACH: 2

Channel Type:
Reach Length (ft.): 5190
Riffle/Flatwater Mean Width (ft.): 5.9
BFW:
Range (ft.): 28 to 39.5
Mean (ft.): 33.734693877551
Std. Dev.: 5.65604430244204
Base Flow (cfs): 0.1
Water (F): 50 - 57 Air (F): 59 - 79
Dry Channel (ft.): 160

Canopy Density (%): 97.4
Coniferous Component (%): 0.0
Hardwood Component (%): 100.0
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 62.1
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Bedrock
Occurrence of LWD (%): 1.0
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 28.1
Pool Frequency (%): 33.7
Residual Pool Depth (%):
< 2 Feet Deep: 84.6
2 to 2.9 Feet Deep: 15.4
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.461
Mean Pool Shelter Rating: 70

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 30.8 Sm Cobble: 38.5 Lg Cobble: 7.7 Boulder: 23.1 Bedrock: 0.0
Embeddedness Values (%): 1. 46.2 2. 15.4 3. 7.7 4. 0.0 5. 30.8

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type:
Reach Length (ft.): 789
Riffle/Flatwater Mean Width (ft.):
BFW:
Range (ft.): 28 to 28
Mean (ft.): 28
Std. Dev.: 0
Base Flow (cfs): 0.1
Water (F): 59 - 59 Air (F): 63 - 63
Dry Channel (ft.): 201

Canopy Density (%): 96.0
Coniferous Component (%): 0.0
Hardwood Component (%): 100.0
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 90.0
Dominant Shelter: Root masses
Dominant Bank Substrate Type: Cobble/Gravel
Occurrence of LWD (%): 5.0
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 29.7
Pool Frequency (%): 41.7
Residual Pool Depth (%):
< 2 Feet Deep: 100.0
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1
Mean Pool Shelter Rating: 145

Pool Tail Substrate (%): Silt/Clay: 50.0 Sand: 0.0 Gravel: 50.0 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0

Embeddedness Values (%): 1. 50.0 2. 0.0 3. 0.0 4. 0.0 5. 50.0

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Huichica Creek **LLID:** 1223492381925 **Drainage:** Napa River

Survey Dates: 10/5/2007 to 10/9/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T04NR04WS18 **Latitude:** 38:11:33.0N **Longitude:** 122:20:57.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	5	12	30.4
Boulder	8	5	23.2
Cobble/Gravel	10	7	30.4
Sand/Silt/Clay	5	4	16.1

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Grass	0	0	0.0
Brush	9	10	33.9
Hardwood Trees	17	15	57.1
Coniferous Trees	0	0	0.0
No Vegetation	2	3	8.9

Total Stream Cobble Embeddedness Values: 3

Table 10 - Mean Percent of Shelter Cover Types For Entire System

Stream Name: Huichica Creek **LLID:** 1223492381925 **Drainage:** Napa River

Survey Dates: 10/5/2007 to 10/9/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T04NR04WS18 **Latitude:** 38:11:33.0N **Longitude:** 122:20:57.0W

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	4
SMALL WOODY DEBRIS (%)	0	0	7
LARGE WOODY DEBRIS (%)	0	0	2
ROOT MASS (%)	4	20	33
TERRESTRIAL VEGETATION (%)	13	20	4
AQUATIC VEGETATION (%)	3	10	17
WHITEWATER (%)	0	0	2
BOULDERS (%)	13	30	27
BEDROCK LEDGES (%)	0	0	4

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Milliken Creek **LLID:** 1222759383169 **Drainage:** Napa River

Survey Dates: 5/29/2007 to 6/6/2007

Confluence Location: **Quad:** YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:19:01.0N **Longitude:** 122:16:33.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (ft.)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (cu.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume Pool Vol	Mean Residual Rating (cu.ft.)	Mean Shelter
1	0	CULVERT	0.3	95	95	0.4									
7	0	DRY	2.4	32	226	0.8									
91	17	FLATWATER	31.3	77	7031	26.3	12.2	0.8	1.5	750	68293	643	58517		43
2	0	NOSURVEY	0.7	2904	5808	21.8									
1	0	NOSURVEY_ MARSH	0.3	1281	1281	4.8									
98	35	POOL	33.7	80	7835	29.4	17.7	1.8	3.0	1379	135108	3257	319151	2760	74
91	9	RIFFLE	31.3	49	4418	16.6	9.0	0.4	0.7	290	26398	157	14323		18

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Milliken Creek **LLID:** 1222759383169 **Drainage:** Napa River

Survey Dates: 5/29/2007 to 6/6/2007

Confluence Location: **Quad:** YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:19:01.0N **Longitude:** 122:16:33.0W

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
291	61	26694	229799	391991

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Milliken Creek **LLID:** 1222759383169 **Drainage:** Napa River

Survey Dates: 5/29/2007 to 6/6/2007

Confluence Location: **Quad:** YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:19:01.0N **Longitude:** 122:16:33.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
61	4	LGR	21.0	45	2754	10.3	10.0	0.4	1.0	349	21301	216	13161		20	70
21	2	HGR	7.2	67	1405	5.3	6.0	0.3	0.8	176	3686	53	1115		40	44
9	3	BRS	3.1	29	259	1.0	10.0	0.5	1.0	288	2589	149	1342		0	47
62	11	GLD	21.3	72	4474	16.8	15.0	0.9	1.8	868	53822	757	46930		28	59
3	0	RUN	1.0	48	144	0.5										83
26	6	SRN	8.9	93	2413	9.0	8.0	0.8	2.5	535	13906	434	11290		70	46
1	1	TRP	0.3	40	40	0.1	5.0	0.8	1.3	200	200	300	300	160	20	97
70	21	MCP	24.1	83	5814	21.8	19.0	2.0	7.7	1564	109457	3826	267830	3283	66	62
1	1	CCP	0.3	79	79	0.3	22.0	0.9	1.9	1738	1738	2259	2259	1564	10	90
9	3	STP	3.1	102	915	3.4	9.0	2.3	4.6	475	4278	1347	12119	1177	80	63
1	1	CRP	0.3	167	167	0.6	26.0	1.8	2.7	4342	4342	9552	9552	7816	120	100
5	3	LSR	1.7	49	245	0.9	14.0	1.5	3.3	739	3693	1643	8213	1367	90	73
7	4	LSBk	2.4	63	444	1.7	18.0	1.7	6.2	1115	7805	2622	18351	2180	105	81
1	0	LSBo	0.3	16	16	0.1										
3	1	BPR	1.0	38	115	0.4	22.0	1.7	2.9	1034	3102	2068	6204	1758	105	85
7	0	DRY	2.4	32	226	0.8										
1	0	CUL	0.3	95	95	0.4										
2	0	NS	0.7	2904	5808	21.8										
1	0	MAR	0.3	1281	1281	4.8										

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Milliken Creek **LLID:** 1222759383169 **Drainage:** Napa River

Survey Dates: 5/29/2007 to 6/6/2007

Confluence Location: **Quad:** YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:19:01.0N **Longitude:** 122:16:33.0W

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
291	61	26694	229918	398667

Table 3 - Summary of Pools

Stream Name: Milliken Creek **LLID:** 1222759383169 **Drainage:** Napa River

Survey Dates: 5/29/2007 to 6/6/2007

Confluence Location: **Quad:** YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:19:01.0N **Longitude:** 122:16:33.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid. Pool Vol (cu.ft.)	Mean Shelter Rating
81	26	MAIN	83	85	6848	87	17.6	1.9	1392	112780	2854	231157	64
14	8	SCOUR	14	62	872	11	17.4	1.6	1377	19282	2580	36115	101
3	1	BACKWATER	3	38	115	1	22.0	1.7	1034	3102	1758	5273	105

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
98	35	7835	135164	272546

Table 4 - Summary of Maximum Residual Pool Depths by Pool

Stream Name: Milliken Creek **LLID:** 1222759383169 **Drainage:** Napa River

Survey Dates: 5/29/2007 to 6/6/2007

Confluence Location: **Quad:** YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:19:01.0N **Longitude:** 122:16:33.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
21	MCP	60	0	0	4	19	6	29	8	38	3	14
3	LSR	9	0	0	1	33	0	0	2	67	0	0
4	LSBk	11	0	0	2	50	1	25	0	0	1	25
1	CCP	3	0	0	1	100	0	0	0	0	0	0
3	STP	9	0	0	0	0	1	33	1	33	1	33
1	TRP	3	0	0	1	100	0	0	0	0	0	0
1	BPR	3	0	0	0	0	1	100	0	0	0	0
0	LSBo	0	0	0	0	0	0	0	0	0	0	0
1	CRP	3	0	0	0	0	1	100	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1<2 Feet Max Resid. Depth	Total 1< 2 Feet % Occurrence	Total 2<3 Feet Max Resid. Depth	Total 2< 3 Feet % Occurrence	Total 3<4 Feet Max Resid. Depth	Total 3< 4 Feet % Occurrence	Total >=4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
35	0	0	9	26	10	29	11	31	5	14

Mean Maximum Residual Pool Depth (ft.): 3

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Milliken Creek **LLID:** 1222759383169 **Drainage:** Napa River

Survey Dates: 5/29/2007 to 6/6/2007

Confluence Location: **Quad:** YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:19:01.0N **Longitude:** 122:16:33.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
61	4	LGR	0	0	0	0	5	0	10	35	0
21	2	HGR	0	0	0	0	5	0	5	90	0
9	3	BRS	0	0	0	0	0	0	0	0	0
62	11	GLD	0	7	5	4	29	7	0	39	0
3	0	RUN									
26	6	SRN	0	0	0	3	15	7	7	52	0
1	1	TRP	0	0	0	0	20	0	0	0	80
70	21	MCP	1	10	7	9	14	5	0	54	0
1	1	CCP	0	0	0	0	0	0	0	100	0
9	3	STP	0	0	0	3	0	0	37	53	7
1	1	CRP	0	20	20	30	20	0	0	10	0
5	3	LSR	10	17	10	55	8	0	0	0	0
7	4	LSBk	0	5	0	13	10	5	0	50	18
1	0	LSBo									
3	1	BPR	0	10	20	70	0	0	0	0	0
1	0	CUL									
2	0	NS									
1	0	MAR									

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Milliken Creek **LLID:** 1222759383169 **Drainage:** Napa River

Survey Dates: 5/29/2007 to 6/6/2007

Confluence Location: **Quad:** YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:19:01.0N **Longitude:** 122:16:33.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
61	4	LGR	0	0	50	0	0	50	0
21	2	HGR	0	0	0	0	0	50	50
9	3	BRS	0	0	0	0	0	33	67
62	11	GLD	0	9	27	9	45	0	9
3	0	RUN	0	0	0	0	0	0	0
26	6	SRN	0	0	0	17	33	17	33
1	1	TRP	0	0	0	0	0	0	100
70	21	MCP	0	24	0	10	14	33	19
1	1	CCP	0	100	0	0	0	0	0
9	3	STP	0	0	0	0	0	67	33
1	1	CRP	0	0	0	100	0	0	0
5	3	LSR	0	67	0	0	0	33	0
7	4	LSBk	0	25	25	25	25	0	0
1	0	LSBo	0	0	0	0	0	0	0
3	1	BPR	0	100	0	0	0	0	0
1	0	CUL	0	0	0	0	0	0	0
2	0	NS	0	0	0	0	0	0	0
1	0	MAR	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Milliken Creek **LLID:** 1222759383169 **Drainage:** Napa River

Survey Dates: 5/29/2007 to 6/6/2007

Confluence Location: **Quad:** YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:19:01.0N **Longitude:** 122:16:33.0W

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
63	38	62	0	63	73

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Milliken Creek LLID: 1222759383169 Drainage: Napa River
Survey Dates: 5/29/2007 to 6/6/2007 Survey Length (ft.): 26694 Main Channel (ft.): 26458 Side Channel (ft.): 236
Confluence Location: Quad: YOUNTVILLE Legal Description: T000R000S00 Latitude: 38:19:01.0N Longitude: 122:16:33.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: F4
Reach Length (ft.): 7597
Riffle/Flatwater Mean Width (ft.): 10.6
BFW:
Range (ft.): 39 to 46
Mean (ft.): 41.5454545454545
Std. Dev.: 3.36731985044584
Base Flow (cfs):
Water (F): 0 - 63 Air (F): 59 - 75
Dry Channel (ft.): 0

Canopy Density (%): 86.5
Coniferous Component (%): 40.5
Hardwood Component (%): 59.5
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 89.4
Dominant Shelter: Root masses
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 14.6
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 1

Pools by Stream Length (%): 24.2
Pool Frequency (%): 38.2
Residual Pool Depth (%):
< 2 Feet Deep: 25.0
2 to 2.9 Feet Deep: 25.0
3 to 3.9 Feet Deep: 50.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 2.7375
Mean Pool Shelter Rating: 70

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 25.0 Gravel: 37.5 Sm Cobble: 25.0 Lg Cobble: 12.5 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 0.0 2. 37.5 3. 25.0 4. 0.0 5. 37.5

STREAM REACH: 2

Channel Type: F1
Reach Length (ft.): 2883
Riffle/Flatwater Mean Width (ft.): 8.5
BFW:
Range (ft.): 32 to 39
Mean (ft.): 33.6666666666667
Std. Dev.: 2.98142396999972
Base Flow (cfs): 1
Water (F): 61 - 64 Air (F): 59 - 63
Dry Channel (ft.): 0

Canopy Density (%): 94.3
Coniferous Component (%): 18.9
Hardwood Component (%): 81.1
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 80.5
Dominant Shelter: Whitewater
Dominant Bank Substrate Type: Bedrock
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 32.5
Pool Frequency (%): 38.1
Residual Pool Depth (%):
< 2 Feet Deep: 33.3
2 to 2.9 Feet Deep: 33.3
3 to 3.9 Feet Deep: 33.3
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 2.366
Mean Pool Shelter Rating: 43

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 20.0 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 80.0
Embeddedness Values (%): 1. 0.0 2. 0.0 3. 20.0 4. 0.0 5. 80.0

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: F3
Reach Length (ft.): 6850
Riffle/Flatwater Mean Width (ft.): 11.0
BFW:
Range (ft.): 32 to 55
Mean (ft.): 46.7432432432432
Std. Dev.: 7.77914886404295
Base Flow (cfs): 1
Water (F): 59 - 66 Air (F): 59 - 66
Dry Channel (ft.): 0

Canopy Density (%): 52.7
Coniferous Component (%): 22.7
Hardwood Component (%): 77.3
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 80.6
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 5.4
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 25.4
Pool Frequency (%): 29.7
Residual Pool Depth (%):
< 2 Feet Deep: 28.6
2 to 2.9 Feet Deep: 28.6
3 to 3.9 Feet Deep: 42.9
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 2.6
Mean Pool Shelter Rating: 65

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 12.5 Gravel: 25.0 Sm Cobble: 25.0 Lg Cobble: 25.0 Boulder: 12.5 Bedrock: 0.0
Embeddedness Values (%): 1. 0.0 2. 25.0 3. 12.5 4. 12.5 5. 50.0

STREAM REACH: 4

Channel Type: B3
Reach Length (ft.): 9128
Riffle/Flatwater Mean Width (ft.): 11.7
BFW:
Range (ft.): 34 to 100
Mean (ft.): 56.2426470588235
Std. Dev.: 24.4680152334362
Base Flow (cfs): 1
Water (F): 61 - 68 Air (F): 59 - 79
Dry Channel (ft.): 166

Canopy Density (%): 50.6
Coniferous Component (%): 48.2
Hardwood Component (%): 51.8
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 51.3
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 0.3
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 34.4
Pool Frequency (%): 32.4
Residual Pool Depth (%):
< 2 Feet Deep: 23.5
2 to 2.9 Feet Deep: 29.4
3 to 3.9 Feet Deep: 17.6
>= 4 Feet Deep: 29.4
Mean Max Residual Pool Depth (ft.): 3.370
Mean Pool Shelter Rating: 84

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 0.0 Sm Cobble: 11.8 Lg Cobble: 41.2 Boulder: 41.2 Bedrock: 5.9
Embeddedness Values (%): 1. 5.9 2. 0.0 3. 5.9 4. 0.0 5. 88.2

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Milliken Creek **LLID:** 1222759383169 **Drainage:** Napa River

Survey Dates: 5/29/2007 to 6/6/2007

Confluence Location: **Quad:** YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:19:01.0N **Longitude:** 122:16:33.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	22	10	26.2
Boulder	19	28	38.5
Cobble/Gravel	9	9	14.8
Sand/Silt/Clay	11	14	20.5

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Grass	1	3	3.3
Brush	28	21	40.2
Hardwood Trees	20	34	44.3
Coniferous Trees	3	0	2.5
No Vegetation	9	3	9.8

Total Stream Cobble Embeddedness Values: 4

Table 10 - Mean Percent of Shelter Cover Types For Entire System

Stream Name: Milliken Creek **LLID:** 1222759383169 **Drainage:** Napa River

Survey Dates: 5/29/2007 to 6/6/2007

Confluence Location: **Quad:** YOUNTVILLE **Legal Description:** T000R000S00 **Latitude:** 38:19:01.0N **Longitude:** 122:16:33.0W

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	2
SMALL WOODY DEBRIS (%)	0	5	9
LARGE WOODY DEBRIS (%)	0	3	6
ROOT MASS (%)	0	4	14
TERRESTRIAL VEGETATION (%)	3	24	11
AQUATIC VEGETATION (%)	0	7	3
WHITEWATER (%)	6	2	3
BOULDERS (%)	36	44	46
BEDROCK LEDGES (%)	0	0	5

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Murphy Creek **LLID:** 1222378382930 **Drainage:** Napa River

Survey Dates: 9/17/2007 to 9/19/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:17:35.0N **Longitude:** 122:14:16.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
3	0	CULVERT	1.9	16	47	0.6									
3	0	DRY	1.9	34	102	1.3									
62	8	FLATWATER	38.3	42	2596	33.3	5.4	0.4	0.6	218	13535	91	5653		17
3	0	NOSURVEY	1.9	839	2516	32.2									
34	16	POOL	21.0	20	692	8.9	7.9	0.9	1.4	165	5608	182	6192	152	80
57	8	RIFFLE	35.2	32	1850	23.7	4.9	0.2	0.3	120	6826	28	1619		9

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Murphy Creek **LLID:** 1222378382930 **Drainage:** Napa River

Survey Dates: 9/17/2007 to 9/19/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:17:35.0N **Longitude:** 122:14:16.0W

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
162	32	7803	25969	13463

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Murphy Creek **LLID:** 1222378382930 **Drainage:** Napa River

Survey Dates: 9/17/2007 to 9/19/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:17:35.0N **Longitude:** 122:14:16.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
47	6	LGR	29.0	34	1615	20.7	5.0	0.2	0.7	130	6094	33	1562		8	94
1	1	HGR	0.6	25	25	0.3	5.0	0.2	0.4	125	125	25	25		25	100
9	1	BRS	5.6	23	210	2.7	5.0	0.1	0.1	55	495	3	25		0	95
34	3	GLD	21.0	26	879	11.3	5.0	0.5	1.2	132	4477	76	2567		12	93
28	5	SRN	17.3	61	1717	22.0	6.0	0.3	0.9	270	7568	101	2816		20	85
1	1	TRP	0.6	45	45	0.6	3.0	1.1	1.9	135	135	162	162	149	90	94
24	8	MCP	14.8	21	494	6.3	8.0	0.9	2.3	176	4227	191	4595	156	91	94
1	1	STP	0.6	22	22	0.3	11.0	0.9	1.1	242	242	290	290	218	60	91
2	2	LSR	1.2	16	31	0.4	6.0	0.5	1.1	97	194	62	123	49	55	99
1	1	LSBk	0.6	27	27	0.3	7.0	1.0	1.8	189	189	189	189	189	60	85
1	0	LSBo	0.6	17	17	0.2										
4	3	PLP	2.5	14	56	0.7	11.0	1.3	2.8	157	627	206	823	176	77	95
3	0	DRY	1.9	34	102	1.3										
3	0	CUL	1.9	16	47	0.6										
3	0	NS	1.9	839	2516	32.2										

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
162	32	7803	24373	13178

Table 3 - Summary of Pools

Stream Name: Murphy Creek **LLID:** 1222378382930 **Drainage:** Napa River

Survey Dates: 9/17/2007 to 9/19/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:17:35.0N **Longitude:** 122:14:16.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq. ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid. Vol (cu.ft.)	Mean Shelter Rating
26	10	MAIN	76	22	561	81	7.4	0.9	179	4644	161	4189	88
8	6	SCOUR	24	16	131	19	8.8	1.0	142	1137	136	1084	67

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
34	16	692	5781	5273

Table 4 - Summary of Maximum Residual Pool Depths By Pool

Stream Name: Murphy Creek **LLID:** 1222378382930 **Drainage:** Napa River

Survey Dates: 9/17/2007 to 9/19/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:17:35.0N **Longitude:** 122:14:16.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
1	LSBk	6	0	0	1	100	0	0	0	0	0	0
1	TRP	6	0	0	1	100	0	0	0	0	0	0
8	MCP	50	3	38	3	38	2	25	0	0	0	0
2	LSR	13	1	50	1	50	0	0	0	0	0	0
3	PLP	19	0	0	2	67	1	33	0	0	0	0
0	LSBo	0	0	0	0	0	0	0	0	0	0	0
1	STP	6	0	0	1	100	0	0	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1<2 Feet Max Resid. Depth	Total 1< 2 Feet % Occurrence	Total 2<3 Feet Max Resid. Depth	Total 2< 3 Feet % Occurrence	Total 3<4 Feet Max Resid. Depth	Total 3< 4 Feet % Occurrence	Total >=4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
16	4	25	9	56	3	19	0	0	0	0

Mean Maximum Residual Pool Depth (ft.): 1

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Murphy Creek **LLID:** 1222378382930 **Drainage:** Napa River

Survey Dates: 9/17/2007 to 9/19/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:17:35.0N **Longitude:** 122:14:16.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
47	6	LGR	0	0	0	0	25	0	8	17	0
1	1	HGR	0	0	0	0	0	0	50	50	0
9	1	BRS	0	0	0	0	0	0	0	0	0
34	3	GLD	0	0	0	20	0	0	0	47	0
28	5	SRN	0	0	0	20	50	0	7	23	0
1	1	TRP	45	0	0	30	25	0	0	0	0
24	8	MCP	18	10	9	31	17	0	1	14	0
1	1	STP	0	0	0	0	40	30	30	0	0
2	2	LSR	40	0	0	40	0	0	0	20	0
1	1	LSBk	30	0	0	30	40	0	0	0	0
1	0	LSBo									
4	3	PLP	27	10	0	0	13	0	17	30	3
3	0	CUL									
3	0	NS									

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Murphy Creek **LLID:** 1222378382930 **Drainage:** Napa River

Survey Dates: 9/17/2007 to 9/19/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:17:35.0N **Longitude:** 122:14:16.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
47	6	LGR	0	0	83	17	0	0	0
1	1	HGR	0	0	0	0	100	0	0
9	1	BRS	0	0	0	0	0	0	100
34	3	GLD	0	0	67	33	0	0	0
28	5	SRN	0	0	40	0	40	0	20
1	1	TRP	100	0	0	0	0	0	0
24	8	MCP	13	13	38	13	0	0	25
1	1	STP	0	0	100	0	0	0	0
2	2	LSR	0	100	0	0	0	0	0
1	1	LSBk	100	0	0	0	0	0	0
1	0	LSBo	0	0	0	0	0	0	0
4	3	PLP	0	0	67	0	0	0	33
3	0	CUL	0	0	0	0	0	0	0
3	0	NS	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Murphy Creek **LLID:** 1222378382930 **Drainage:** Napa River

Survey Dates: 9/17/2007 to 9/19/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:17:35.0N **Longitude:** 122:14:16.0W

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
92	4	96	0	66	65

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Murphy Creek LLID: 1222378382930 Drainage: Napa River
Survey Dates: 9/17/2007 to 9/19/2007 Survey Length (ft.): 7803 Main Channel (ft.): 7803 Side Channel (ft.): 0
Confluence Location: Quad: MT. GEORGE Legal Description: T000R000S00 Latitude: 38:17:35.0N Longitude: 122:14:16.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: B4
Reach Length (ft.): 1886
Riffle/Flatwater Mean Width (ft.): 4.2
BFW:
Range (ft.): 7.1999 to 7.19999
Mean (ft.): 7.2
Std. Dev.: 1.71694256034804E-15
Base Flow (cfs): 0
Water (F): 60 - 61 Air (F): 70 - 77
Dry Channel (ft.): 102

Canopy Density (%): 91.8
Coniferous Component (%): 0.0
Hardwood Component (%): 100.0
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 84.6
Dominant Shelter: Terrestrial Veg.
Dominant Bank Substrate Type: Cobble/Gravel
Occurrence of LWD (%): 8.3
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 1

Pools by Stream Length (%): 5.1
Pool Frequency (%): 20.0
Residual Pool Depth (%):
< 2 Feet Deep: 66.7
2 to 2.9 Feet Deep: 33.3
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.966
Mean Pool Shelter Rating: 77

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 66.7 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 33.3
Embeddedness Values (%): 1. 33.3 2. 33.3 3. 0.0 4. 0.0 5. 33.3

STREAM REACH: 2

Channel Type: B4
Reach Length (ft.): 1856
Riffle/Flatwater Mean Width (ft.): 5.2
BFW:
Range (ft.): 7 to 12
Mean (ft.): 8.84848484848485
Std. Dev.: 1.96516962212167
Base Flow (cfs): 0.33
Water (F): 59 - 62 Air (F): 63 - 77
Dry Channel (ft.): 0

Canopy Density (%): 84.7
Coniferous Component (%): 5.4
Hardwood Component (%): 94.6
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 62.8
Dominant Shelter: Terrestrial Veg.
Dominant Bank Substrate Type: Cobble/Gravel
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 5.2
Pool Frequency (%): 15.2
Residual Pool Depth (%):
< 2 Feet Deep: 100.0
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 0.8
Mean Pool Shelter Rating: 150

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 100.0 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 50.0 2. 0.0 3. 50.0 4. 0.0 5. 0.0

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: F4
Reach Length (ft.): 2698
Riffle/Flatwater Mean Width (ft.): 7.0
BFW:
Range (ft.): 11 to 15.5
Mean (ft.): 12.9756097560976
Std. Dev.: 1.6265751072167
Base Flow (cfs): 0.5
Water (F): 59 - 62 Air (F): 63 - 70
Dry Channel (ft.): 0

Canopy Density (%): 95.4
Coniferous Component (%): 1.2
Hardwood Component (%): 98.8
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 47.0
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 2.5
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 11.7
Pool Frequency (%): 19.5
Residual Pool Depth (%):
< 2 Feet Deep: 85.7
2 to 2.9 Feet Deep: 14.3
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.292
Mean Pool Shelter Rating: 64

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 42.9 Sm Cobble: 28.6 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 28.6
Embeddedness Values (%): 1. 57.1 2. 0.0 3. 14.3 4. 0.0 5. 28.6

STREAM REACH: 4

Channel Type: F4
Reach Length (ft.): 1363
Riffle/Flatwater Mean Width (ft.): 4.5
BFW:
Range (ft.): 15.5 to 15.5
Mean (ft.): 15.5
Std. Dev.: 0
Base Flow (cfs): 0.5
Water (F): 59 - 59 Air (F): 61 - 68
Dry Channel (ft.): 0

Canopy Density (%): 93.3
Coniferous Component (%): 10.8
Hardwood Component (%): 89.2
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 76.6
Dominant Shelter: Terrestrial Veg.
Dominant Bank Substrate Type: Bedrock
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 13.5
Pool Frequency (%): 31.3
Residual Pool Depth (%):
< 2 Feet Deep: 75.0
2 to 2.9 Feet Deep: 25.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.4375
Mean Pool Shelter Rating: 75

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 50.0 Sm Cobble: 50.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 50.0 2. 25.0 3. 25.0 4. 0.0 5. 0.0

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Murphy Creek **LLID:** 1222378382930 **Drainage:** Napa River

Survey Dates: 9/17/2007 to 9/19/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:17:35.0N **Longitude:** 122:14:16.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	7	6	20.3
Boulder	5	5	15.6
Cobble/Gravel	12	12	37.5
Sand/Silt/Clay	8	9	26.6

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Grass	0	2	3.1
Brush	17	18	54.7
Hardwood Trees	13	10	35.9
Coniferous Trees	0	0	0.0
No Vegetation	2	2	6.3

Total Stream Cobble Embeddedness Values: 2

Table 10 - Mean Percent of Shelter Cover Types For Entire System

Stream Name: Murphy Creek **LLID:** 1222378382930 **Drainage:** Napa River

Survey Dates: 9/17/2007 to 9/19/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:17:35.0N **Longitude:** 122:14:16.0W

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	23
SMALL WOODY DEBRIS (%)	0	0	7
LARGE WOODY DEBRIS (%)	0	0	5
ROOT MASS (%)	0	20	24
TERRESTRIAL VEGETATION (%)	19	31	18
AQUATIC VEGETATION (%)	0	0	2
WHITEWATER (%)	13	4	6
BOULDERS (%)	19	32	15
BEDROCK LEDGES (%)	0	0	1

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Pickle Canyon **LLID:** 1223704383341 **Drainage:** Napa River

Survey Dates: 4/26/2007 to 4/30/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T000R000S00 **Latitude:** 38:20:03.0N **Longitude:** 122:22:13.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
1	0	CULVERT	0.3	14	14	0.1									
104	10	FLATWATER	35.7	42	4379	26.2	7.3	0.5	1.0	301	31262	135	14079		32
2	0	NOSURVEY	0.7	1629	3258	19.5									
66	27	POOL	22.7	35	2286	13.7	9.9	1.0	1.8	315	20766	398	26287	331	72
118	13	RIFFLE	40.5	58	6800	40.6	8.1	0.4	0.7	488	57608	191	22595		23

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Pickle Canyon **LLID:** 1223704383341 **Drainage:** Napa River

Survey Dates: 4/26/2007 to 4/30/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T000R000S00 **Latitude:** 38:20:03.0N **Longitude:** 122:22:13.0W

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
291	50	16737	109636	62960

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Pickle Canyon **LLID:** 1223704383341 **Drainage:** Napa River

Survey Dates: 4/26/2007 to 4/30/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T000R000S00 **Latitude:** 38:20:03.0N **Longitude:** 122:22:13.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
101	11	LGR	34.7	60	6099	36.4	8.0	0.4	1.0	548	55330	215	21678		24	81
16	2	HGR	5.5	42	677	4.0	7.0	0.4	0.8	160	2565	64	1026		20	98
1	0	BRS	0.3	24	24	0.1										
77	6	GLD	26.5	39	3002	17.9	8.0	0.5	1.3	302	23254	120	9211		23	94
6	1	RUN	2.1	25	150	0.9	4.0	0.5	1.1	124	744	62	372		50	94
21	3	SRN	7.2	58	1227	7.3	8.0	0.5	1.2	357	7490	191	4018		43	82
2	2	TRP	0.7	32	63	0.4	9.0	1.2	2.4	284	567	425	851	343	73	73
51	17	MCP	17.5	33	1685	10.1	10.0	0.9	3.1	285	14520	366	18643	306	61	90
5	2	STP	1.7	47	233	1.4	8.0	1.0	2.0	401	2005	473	2365	413	90	69
2	1	CRP	0.7	52	105	0.6	12.0	0.6	1.1	588	1176	529	1058	353	120	100
2	2	LSR	0.7	40	79	0.5	14.0	1.0	3.5	553	1106	770	1540	658	165	86
3	2	LSBk	1.0	35	105	0.6	7.0	0.7	1.6	216	648	185	554	151	10	75
1	1	PLP	0.3	16	16	0.1	10.0	1.6	2.0	160	160	304	304	256	120	70
1	0	CUL	0.3	14	14	0.1										
2	0	NS	0.7	1629	3258	19.5										

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
291	50	16737	109565	61620

Table 3 - Summary of Pools

Stream Name: Pickle Canyon **LLID:** 1223704383341 **Drainage:** Napa River

Survey Dates: 4/26/2007 to 4/30/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T000R000S00 **Latitude:** 38:20:03.0N **Longitude:** 122:22:13.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq. ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid. Vol (cu.ft.)	Mean Shelter Rating
58	21	MAIN	88	34	1981	87	9.6	1.0	296	17149	320	18551	65
8	6	SCOUR	12	38	305	13	10.7	0.9	381	3048	371	2970	98

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
66	27	2286	20197	21520

Table 4 - Summary of Maximum Residual Pool Depths By Pool

Stream Name: Pickle Canyon **LLID:** 1223704383341 **Drainage:** Napa River

Survey Dates: 4/26/2007 to 4/30/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T000R000S00 **Latitude:** 38:20:03.0N **Longitude:** 122:22:13.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
17	MCP	63	1	6	11	65	4	24	1	6	0	0
1	CRP	4	0	0	1	100	0	0	0	0	0	0
2	LSBk	7	0	0	2	100	0	0	0	0	0	0
2	LSR	7	0	0	1	50	0	0	1	50	0	0
2	TRP	7	0	0	0	0	2	100	0	0	0	0
1	PLP	4	0	0	0	0	1	100	0	0	0	0
2	STP	7	0	0	1	50	1	50	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1<2 Feet Max Resid. Depth	Total 1< 2 Feet % Occurrence	Total 2<3 Feet Max Resid. Depth	Total 2< 3 Feet % Occurrence	Total 3<4 Feet Max Resid. Depth	Total 3< 4 Feet % Occurrence	Total >=4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
27	1	4	16	59	8	30	2	7	0	0

Mean Maximum Residual Pool Depth (ft.): 2

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Pickle Canyon **LLID:** 1223704383341 **Drainage:** Napa River

Survey Dates: 4/26/2007 to 4/30/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T000R000S00 **Latitude:** 38:20:03.0N **Longitude:** 122:22:13.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
101	11	LGR	0	0	0	0	4	0	11	85	0
16	2	HGR	0	0	0	0	0	0	15	85	0
1	0	BRS									
77	6	GLD	0	0	13	17	2	0	0	52	0
6	1	RUN	0	50	0	0	0	0	0	50	0
21	3	SRN	0	0	0	0	0	10	10	80	0
2	2	TRP	0	0	0	25	0	0	10	25	40
51	17	MCP	1	6	5	15	7	3	3	57	4
5	2	STP	0	0	25	5	5	25	20	20	0
2	1	CRP	0	25	25	50	0	0	0	0	0
2	2	LSR	0	18	5	48	13	0	0	18	0
3	2	LSBk	0	0	0	0	0	0	0	0	50
1	1	PLP	10	10	10	20	20	10	5	15	0
1	0	CUL									
2	0	NS									

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Pickle Canyon **LLID:** 1223704383341 **Drainage:** Napa River

Survey Dates: 4/26/2007 to 4/30/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T000R000S00 **Latitude:** 38:20:03.0N **Longitude:** 122:22:13.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
101	11	LGR	0	0	55	0	27	9	9
16	2	HGR	0	0	0	0	0	100	0
1	0	BRS	0	0	0	0	0	0	0
77	6	GLD	0	0	67	17	0	17	0
6	1	RUN	0	0	100	0	0	0	0
21	3	SRN	0	0	0	0	0	100	0
2	2	TRP	0	0	0	0	0	0	100
51	17	MCP	6	47	24	6	6	6	6
5	2	STP	0	0	50	0	0	0	50
2	1	CRP	0	0	100	0	0	0	0
2	2	LSR	0	50	50	0	0	0	0
3	2	LSBk	0	0	100	0	0	0	0
1	1	PLP	0	0	100	0	0	0	0
1	0	CUL	0	0	0	0	0	0	0
2	0	NS	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Pickle Canyon **LLID:** 1223704383341 **Drainage:** Napa River

Survey Dates: 4/26/2007 to 4/30/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T000R000S00 **Latitude:** 38:20:03.0N **Longitude:** 122:22:13.0W

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
87	59	41	0	73	80

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Pickle Canyon LLID: 1223704383341 Drainage: Napa River
Survey Dates: 4/26/2007 to 4/30/2007 Survey Length (ft.): 16737 Main Channel (ft.): 16737 Side Channel (ft.): 0
Confluence Location: Quad: SONOMA Legal Description: T000R000S00 Latitude: 38:20:03.0N Longitude: 122:22:13.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: C4
Reach Length (ft.): 3455
Riffle/Flatwater Mean Width (ft.): 8.3
BFW:
Range (ft.): 22 to 27
Mean (ft.): 25.3333333333333
Std. Dev.: 2.35702260395516
Base Flow (cfs): 3
Water (F): 50 - 50 Air (F): 63 - 64
Dry Channel (ft.): 0

Canopy Density (%): 90.0
Coniferous Component (%): 48.5
Hardwood Component (%): 51.5
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 70.8
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Cobble/Gravel
Occurrence of LWD (%): 4.2
LWD per 100 ft.:
Riffles: 0
Pools: 1
Flat: 0

Pools by Stream Length (%): 4.8
Pool Frequency (%): 16.7
Residual Pool Depth (%):
< 2 Feet Deep: 100.0
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.35
Mean Pool Shelter Rating: 53

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 100.0 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 0.0 2. 66.7 3. 33.3 4. 0.0 5. 0.0

STREAM REACH: 2

Channel Type: C4
Reach Length (ft.): 6375
Riffle/Flatwater Mean Width (ft.): 8.3
BFW:
Range (ft.): 18 to 32
Mean (ft.): 24.818018018018
Std. Dev.: 4.25818127649108
Base Flow (cfs): 3
Water (F): 50 - 55 Air (F): 66 - 79
Dry Channel (ft.): 0

Canopy Density (%): 84.9
Coniferous Component (%): 65.9
Hardwood Component (%): 34.1
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 82.2
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Cobble/Gravel
Occurrence of LWD (%): 0.9
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 16.2
Pool Frequency (%): 26.1
Residual Pool Depth (%):
< 2 Feet Deep: 58.3
2 to 2.9 Feet Deep: 25.0
3 to 3.9 Feet Deep: 16.7
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.920
Mean Pool Shelter Rating: 66

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 91.7 Sm Cobble: 0.0 Lg Cobble: 8.3 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 50.0 2. 16.7 3. 25.0 4. 0.0 5. 8.3

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: B4
Reach Length (ft.): 2541
Riffle/Flatwater Mean Width (ft.): 7.5
BFW:
Range (ft.): 21.799 to 26
Mean (ft.): 23.2509803921568
Std. Dev.: 1.58440593791052
Base Flow (cfs): 2
Water (F): 52 - 56 Air (F): 70 - 81
Dry Channel (ft.): 0

Canopy Density (%): 89.9
Coniferous Component (%): 58.2
Hardwood Component (%): 41.8
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 60.7
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 14.3
LWD per 100 ft.:
Riffles: 0
Pools: 3
Flat: 0

Pools by Stream Length (%): 14.5
Pool Frequency (%): 19.6
Residual Pool Depth (%):
< 2 Feet Deep: 40.0
2 to 2.9 Feet Deep: 60.0
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 2.03
Mean Pool Shelter Rating: 107

Pool Tail Substrate (%): Silt/Clay: 20.0 Sand: 0.0 Gravel: 60.0 Sm Cobble: 20.0 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 0.0 2. 20.0 3. 40.0 4. 20.0 5. 20.0

STREAM REACH: 4

Channel Type: A3
Reach Length (ft.): 4366
Riffle/Flatwater Mean Width (ft.): 6.7
BFW:
Range (ft.): 16 to 24.7999
Mean (ft.): 18.2070707070707
Std. Dev.: 2.15585894317771
Base Flow (cfs): 1
Water (F): 53 - 58 Air (F): 61 - 81
Dry Channel (ft.): 0

Canopy Density (%): 85.6
Coniferous Component (%): 52.9
Hardwood Component (%): 47.1
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 77.0
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 8.6
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 16.5
Pool Frequency (%): 22.2
Residual Pool Depth (%):
< 2 Feet Deep: 71.4
2 to 2.9 Feet Deep: 28.6
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.557
Mean Pool Shelter Rating: 67

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 28.6 Sm Cobble: 28.6 Lg Cobble: 14.3 Boulder: 14.3 Bedrock: 14.3
Embeddedness Values (%): 1. 28.6 2. 28.6 3. 0.0 4. 0.0 5. 42.9

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Pickle Canyon **LLID:** 1223704383341 **Drainage:** Napa River

Survey Dates: 4/26/2007 to 4/30/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T000R000S00 **Latitude:** 38:20:03.0N **Longitude:** 122:22:13.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	13	11	24.0
Boulder	18	12	30.0
Cobble/Gravel	11	18	29.0
Sand/Silt/Clay	8	9	17.0

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Grass	1	1	2.0
Brush	25	27	52.0
Hardwood Trees	8	9	17.0
Coniferous Trees	12	12	24.0
No Vegetation	4	1	5.0

Total Stream Cobble Embeddedness Values: 3

Table 10 - Mean Percent of Shelter Cover Types For Entire System

Stream Name: Pickle Canyon **LLID:** 1223704383341 **Drainage:** Napa River

Survey Dates: 4/26/2007 to 4/30/2007

Confluence Location: **Quad:** SONOMA **Legal Description:** T000R000S00 **Latitude:** 38:20:03.0N **Longitude:** 122:22:13.0W

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	1
SMALL WOODY DEBRIS (%)	0	5	6
LARGE WOODY DEBRIS (%)	0	8	7
ROOT MASS (%)	0	10	18
TERRESTRIAL VEGETATION (%)	3	1	6
AQUATIC VEGETATION (%)	0	3	4
WHITEWATER (%)	12	3	4
BOULDERS (%)	85	60	41
BEDROCK LEDGES (%)	0	0	9

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Redwood Creek **LLID:** 1223123383049 **Drainage:** Napa River

Survey Dates: 4/2/2007 to 4/25/2007

Confluence Location: **Quad:** RUTHERFORD **Legal Description:** T000R000S00 **Latitude:** 38:18:18.0N **Longitude:** 122:18:44.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
163	14	FLATWATER	33.4	71	11636	20.9	13.4	0.8	1.4	816	133065	652	106223		46
3	0	NOSURVEY	0.6	8487	25460	45.8									
150	54	POOL	30.7	64	9638	17.3	15.8	1.4	2.9	1142	171249	2322	348229	1888	72
172	27	RIFFLE	35.2	52	8890	16.0	10.9	0.4	1.1	423	72719	195	33501		40

Total Units	Total Units Fully Meassured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
488	95	55624	377034	487952

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Redwood Creek **LLID:** 1223123383049 **Drainage:** Napa River

Survey Dates: 4/2/2007 to 4/25/2007

Confluence Location: **Quad:** RUTHERFORD **Legal Description:** T000R000S00 **Latitude:** 38:18:18.0N **Longitude:** 122:18:44.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
141	19	LGR	28.9	53	7501	13.5	11.0	0.4	9.0	440	62013	177	24989		27	80
21	5	HGR	4.3	56	1167	2.1	11.0	0.5	1.7	432	9075	299	6271		65	86
4	2	CAS	0.8	22	90	0.2	10.0	0.4	1.5	235	942	114	455		120	91
6	1	BRS	1.2	22	132	0.2	10.0	0.4	0.7	428	2565	171	1026		0	95
109	6	GLD	22.3	72	7894	14.2	17.0	0.9	2.2	1092	119064	937	102115		34	81
18	3	RUN	3.7	43	769	1.4	8.0	0.5	1.1	385	6928	186	3356		27	76
36	5	SRN	7.4	83	2973	5.3	12.0	0.8	1.6	744	26786	589	21190		72	92
4	3	TRP	0.8	88	350	0.6	14.0	1.8	3.8	1272	5089	2612	10446	2203	118	70
88	25	MCP	18.0	58	5096	9.2	16.0	1.3	6.1	1064	93639	2077	182751	1642	64	79
19	4	CCP	3.9	75	1432	2.6	18.0	1.8	5.3	2247	42693	4928	93629	4017	70	83
7	4	STP	1.4	67	467	0.8	14.0	0.8	2.5	705	4932	906	6340	599	95	93
15	7	CRP	3.1	97	1450	2.6	21.0	2.1	5.5	1833	27499	4280	64193	3756	64	70
2	1	LSL	0.4	60	121	0.2	13.0	1.0	1.4	468	936	608	1217	468	50	98
6	4	LSR	1.2	35	212	0.4	10.0	0.7	2.5	375	2252	486	2916	303	70	98
9	6	LSBk	1.8	57	510	0.9	13.0	1.9	5.3	770	6934	1628	14650	1314	78	80
3	0	NS	0.6	8487	25460	45.8										

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
488	95	55624	411346	535544

Table 3 - Summary of Pools

Stream Name: Redwood Creek **LLID:** 1223123383049 **Drainage:** Napa River

Survey Dates: 4/2/2007 to 4/25/2007

Confluence Location: **Quad:** RUTHERFORD **Legal Description:** T000R000S00 **Latitude:** 38:18:18.0N **Longitude:** 122:18:44.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq. ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid. Vol (cu.ft.)	Mean Shelter Rating
118	36	MAIN	79	62	7345	76	15.9	1.3	1173	138404	1836	216701	73
32	18	SCOUR	21	72	2293	24	15.6	1.7	1079	34533	1992	63745	69

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
150	54	9638	172937	280446

Table 4 - Summary of Maximum Residual Pool Depths By Pool

Stream Name: Redwood Creek **LLID:** 1223123383049 **Drainage:** Napa River

Survey Dates: 4/2/2007 to 4/25/2007

Confluence Location: **Quad:** RUTHERFORD **Legal Description:** T000R000S00 **Latitude:** 38:18:18.0N **Longitude:** 122:18:44.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
4	CCP	7	0	0	0	0	1	25	2	50	1	25
7	CRP	13	0	0	0	0	0	0	2	29	5	71
25	MCP	46	0	0	9	36	7	28	7	28	2	8
6	LSBk	11	0	0	0	0	1	17	2	33	3	50
3	TRP	6	0	0	0	0	0	0	3	100	0	0
4	LSR	7	0	0	3	75	1	25	0	0	0	0
1	LSL	2	0	0	1	100	0	0	0	0	0	0
4	STP	7	0	0	3	75	1	25	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1<2 Feet Max Resid. Depth	Total 1< 2 Feet % Occurrence	Total 2<3 Feet Max Resid. Depth	Total 2< 3 Feet % Occurrence	Total 3<4 Feet Max Resid. Depth	Total 3< 4 Feet % Occurrence	Total >=4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
54	0	0	16	30	11	20	16	30	11	20

Mean Maximum Residual Pool Depth (ft.): 3

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Redwood Creek **LLID:** 1223123383049 **Drainage:** Napa River

Survey Dates: 4/2/2007 to 4/25/2007

Confluence Location: **Quad:** RUTHERFORD **Legal Description:** T000R000S00 **Latitude:** 38:18:18.0N **Longitude:** 122:18:44.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
141	19	LGR	0	1	3	0	1	5	10	54	0
21	5	HGR	0	0	5	7	0	0	37	51	0
4	2	CAS	0	0	0	5	5	10	15	15	0
6	1	BRS	0	0	0	0	0	0	0	0	0
109	6	GLD	4	23	8	28	17	0	0	20	0
18	3	RUN	33	0	0	0	0	0	0	67	0
36	5	SRN	4	2	0	26	10	0	20	38	0
4	3	TRP	7	7	0	20	17	7	3	40	0
88	25	MCP	10	5	7	11	7	2	4	45	10
19	4	CCP	8	0	3	53	8	0	8	15	8
7	4	STP	5	0	0	8	0	0	34	49	5
15	7	CRP	19	11	3	19	10	1	0	21	16
2	1	LSL	10	0	65	25	0	0	0	0	0
6	4	LSR	14	5	11	39	0	0	0	31	0
9	6	LSBk	8	4	2	15	6	0	0	18	47
3	0	NS									

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Redwood Creek **LLID:** 1223123383049 **Drainage:** Napa River

Survey Dates: 4/2/2007 to 4/25/2007

Confluence Location: **Quad:** RUTHERFORD **Legal Description:** T000R000S00 **Latitude:** 38:18:18.0N **Longitude:** 122:18:44.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
141	19	LGR	0	5	21	26	32	16	0
21	5	HGR	0	0	0	0	20	60	20
4	2	CAS	0	0	0	0	0	100	0
6	1	BRS	0	0	0	0	0	0	100
109	6	GLD	0	17	67	0	0	17	0
18	3	RUN	0	0	33	33	0	33	0
36	5	SRN	0	0	40	0	20	40	0
4	3	TRP	0	67	33	0	0	0	0
88	25	MCP	0	32	20	8	12	24	4
19	4	CCP	0	50	50	0	0	0	0
7	4	STP	0	0	25	0	0	50	25
15	7	CRP	0	57	43	0	0	0	0
2	1	LSL	0	100	0	0	0	0	0
6	4	LSR	0	0	50	0	25	25	0
9	6	LSBk	0	50	33	0	17	0	0
3	0	NS	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Redwood Creek **LLID:** 1223123383049 **Drainage:** Napa River

Survey Dates: 4/2/2007 to 4/25/2007

Confluence Location: **Quad:** RUTHERFORD **Legal Description:** T000R000S00 **Latitude:** 38:18:18.0N **Longitude:** 122:18:44.0W

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
81	49	51	1	80	82

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Redwood Creek LLID: 1223123383049 Drainage: Napa River
Survey Dates: 4/2/2007 to 4/25/2007 Survey Length (ft.): 55624 Main Channel (ft.): 55199 Side Channel (ft.): 425
Confluence Location: Quad: RUTHERFORD Legal Description: T000R000S00 Latitude: 38:18:18.0N Longitude: 122:18:44.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: F4
Reach Length (ft.): 12545
Riffle/Flatwater Mean Width (ft.): 12.6
BFW:
Range (ft.): 28.5 to 42
Mean (ft.): 35.9630136986301
Std. Dev.: 3.96360175381257
Base Flow (cfs): 5
Water (F): 50 - 54 Air (F): 57 - 75
Dry Channel (ft.): 0

Canopy Density (%): 76.0
Coniferous Component (%): 64.2
Hardwood Component (%): 35.8
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 79.6
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Cobble/Gravel
Occurrence of LWD (%): 4.3
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 28.9
Pool Frequency (%): 32.9
Residual Pool Depth (%):
< 2 Feet Deep: 0.0
2 to 2.9 Feet Deep: 18.8
3 to 3.9 Feet Deep: 50.0
>= 4 Feet Deep: 31.3
Mean Max Residual Pool Depth (ft.): 3.881
Mean Pool Shelter Rating: 61

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 11.8 Gravel: 70.6 Sm Cobble: 17.6 Lg Cobble: 0.0 Boulder: 0.0 Bedrock: 0.0
Embeddedness Values (%): 1. 11.8 2. 29.4 3. 47.1 4. 11.8 5. 0.0

STREAM REACH: 2

Channel Type: F4
Reach Length (ft.): 19789
Riffle/Flatwater Mean Width (ft.): 11.8
BFW:
Range (ft.): 28 to 50
Mean (ft.): 42.5232142857143
Std. Dev.: 5.71372588403497
Base Flow (cfs): 5
Water (F): 48 - 55 Air (F): 54 - 81
Dry Channel (ft.): 0

Canopy Density (%): 73.0
Coniferous Component (%): 31.5
Hardwood Component (%): 68.5
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 79.5
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Cobble/Gravel
Occurrence of LWD (%): 5.3
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 18.5
Pool Frequency (%): 28.6
Residual Pool Depth (%):
< 2 Feet Deep: 21.1
2 to 2.9 Feet Deep: 21.1
3 to 3.9 Feet Deep: 36.8
>= 4 Feet Deep: 21.1
Mean Max Residual Pool Depth (ft.): 3.021
Mean Pool Shelter Rating: 69

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 15.8 Gravel: 47.4 Sm Cobble: 26.3 Lg Cobble: 5.3 Boulder: 5.3 Bedrock: 0.0
Embeddedness Values (%): 1. 36.8 2. 36.8 3. 5.3 4. 21.1 5. 0.0

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: B4
Reach Length (ft.): 18883
Riffle/Flatwater Mean Width (ft.): 10.1
BFW:
Range (ft.): 22.600 to 38
Mean (ft.): 32.7325301204819
Std. Dev.: 4.24468791858732
Base Flow (cfs): 5
Water (F): 50 - 52 Air (F): 55 - 70
Dry Channel (ft.): 0

Canopy Density (%): 92.3
Coniferous Component (%): 37.2
Hardwood Component (%): 62.8
Dominant Bank Vegetation: Hardwood Trees
Vegetative Cover (%): 79.3
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 5.9
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 5.1
Pool Frequency (%): 22.9
Residual Pool Depth (%):
< 2 Feet Deep: 71.4
2 to 2.9 Feet Deep: 0.0
3 to 3.9 Feet Deep: 14.3
>= 4 Feet Deep: 14.3
Mean Max Residual Pool Depth (ft.): 2.2
Mean Pool Shelter Rating: 81

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 71.4 Sm Cobble: 0.0 Lg Cobble: 0.0 Boulder: 14.3 Bedrock: 14.3
Embeddedness Values (%): 1. 42.9 2. 14.3 3. 14.3 4. 14.3 5. 14.3

STREAM REACH: 4

Channel Type: A2
Reach Length (ft.): 3982
Riffle/Flatwater Mean Width (ft.): 12.6
BFW:
Range (ft.): 20 to 34
Mean (ft.): 27.1456790123457
Std. Dev.: 4.52275588941505
Base Flow (cfs): 5
Water (F): 48 - 50 Air (F): 54 - 62
Dry Channel (ft.): 0

Canopy Density (%): 96.3
Coniferous Component (%): 68.1
Hardwood Component (%): 31.9
Dominant Bank Vegetation: Coniferous Trees
Vegetative Cover (%): 85.1
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Boulder
Occurrence of LWD (%): 3.7
LWD per 100 ft.:
Riffles: 1
Pools: 1
Flat: 0

Pools by Stream Length (%): 33.0
Pool Frequency (%): 39.5
Residual Pool Depth (%):
< 2 Feet Deep: 58.3
2 to 2.9 Feet Deep: 33.3
3 to 3.9 Feet Deep: 0.0
>= 4 Feet Deep: 8.3
Mean Max Residual Pool Depth (ft.): 2
Mean Pool Shelter Rating: 84

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 33.3 Sm Cobble: 16.7 Lg Cobble: 33.3 Boulder: 16.7 Bedrock: 0.0
Embeddedness Values (%): 1. 58.3 2. 0.0 3. 0.0 4. 25.0 5. 16.7

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Redwood Creek **LLID:** 1223123383049 **Drainage:** Napa River

Survey Dates: 4/2/2007 to 4/25/2007

Confluence Location: **Quad:** RUTHERFORD **Legal Description:** T000R000S00 **Latitude:** 38:18:18.0N **Longitude:** 122:18:44.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	13	16	15.3
Boulder	33	27	31.6
Cobble/Gravel	29	23	27.4
Sand/Silt/Clay	20	28	25.3

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Grass	2	2	2.1
Brush	30	21	26.8
Hardwood Trees	37	47	44.2
Coniferous Trees	25	24	25.8
No Vegetation	1	1	1.1

Total Stream Cobble Embeddedness Values: 2

Table 10 - Mean Percent of Shelter Cover Types For Entire System

Stream Name: Redwood Creek **LLID:** 1223123383049 **Drainage:** Napa River

Survey Dates: 4/2/2007 to 4/25/2007

Confluence Location: **Quad:** RUTHERFORD **Legal Description:** T000R000S00 **Latitude:** 38:18:18.0N **Longitude:** 122:18:44.0W

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	10	10
SMALL WOODY DEBRIS (%)	0	10	5
LARGE WOODY DEBRIS (%)	3	4	6
ROOT MASS (%)	2	21	18
TERRESTRIAL VEGETATION (%)	1	11	7
AQUATIC VEGETATION (%)	4	0	1
WHITEWATER (%)	15	7	5
BOULDERS (%)	49	36	35
BEDROCK LEDGES (%)	0	0	13

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Salvador Creek **LLID:** 1222832383263 **Drainage:** Napa River

Survey Dates: 8/30/2007 to 8/31/2007

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:19:35.0N **Longitude:** 122:16:60.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
5	0	CULVERT	4.4	57	285	3.2									
7	0	DRY	6.1	56	390	4.4									
33	3	FLATWATER	28.9	94	3100	35.0	12.0	0.9	1.2	1187	39182	1518	50101		137
1	0	NOSURVEY	0.9	607	607	6.8									
35	12	POOL	30.7	102	3553	40.1	14.3	1.7	2.6	1001	35029	2103	73611	1879	76
33	5	RIFFLE	28.9	28	929	10.5	7.8	0.2	0.4	290	9583	92	3039		2

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Salvador Creek **LLID:** 1222832383263 **Drainage:** Napa River

Survey Dates: 8/30/2007 to 8/31/2007

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:19:35.0N **Longitude:** 122:16:60.0W

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
114	20	8864	83794	126750

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Salvador Creek **LLID:** 1222832383263 **Drainage:** Napa River

Survey Dates: 8/30/2007 to 8/31/2007

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:19:35.0N **Longitude:** 122:16:60.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
33	5	LGR	28.9	28	929	10.5	8.0	0.2	0.9	290	9583	92	3039		2	88
32	2	GLD	28.1	95	3028	34.2	15.0	1.2	1.8	1565	50080	2213	70800		155	56
1	1	RUN	0.9	72	72	0.8	6.0	0.3	0.5	432	432	130	130		100	62
1	1	TRP	0.9	41	41	0.5	7.0	1.0	1.4	287	287	287	287	287	60	98
30	8	MCP	26.3	110	3312	37.4	15.0	1.8	4.6	1190	35704	2618	78530	2291	83	76
1	1	STP	0.9	52	52	0.6	9.0	0.9	2.0	468	468	515	515	445	50	89
1	1	CRP	0.9	63	63	0.7	18.0	2.5	2.8	1134	1134	2835	2835	2829	90	51
2	1	LSR	1.8	42	85	1.0	15.0	1.1	1.7	600	1200	660	1320	657	50	100
7	0	DRY	6.1	56	390	4.4										92
5	0	CUL	4.4	57	285	3.2										
1	0	NS	0.9	607	607	6.8										

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
114	20	8864	98888	157455

Table 3 - Summary of Pools

Stream Name: Salvador Creek **LLID:** 1222832383263 **Drainage:** Napa River

Survey Dates: 8/30/2007 to 8/31/2007

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:19:35.0N **Longitude:** 122:16:60.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq. ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid. Vol (cu.ft.)	Mean Shelter Rating
32	10	MAIN	91	106	3405	96	13.8	1.7	1028	32883	1906	60979	77
3	2	SCOUR	9	49	148	4	16.5	1.8	867	2601	1743	5229	70

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
35	12	3553	35484	66208

Table 4 - Summary of Maximum Residual Pool Depths By Pool

Stream Name: Salvador Creek **LLID:** 1222832383263 **Drainage:** Napa River

Survey Dates: 8/30/2007 to 8/31/2007

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:19:35.0N **Longitude:** 122:16:60.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
8	MCP	67	0	0	1	13	3	38	2	25	2	25
1	LSR	8	0	0	1	100	0	0	0	0	0	0
1	CRP	8	0	0	0	0	1	100	0	0	0	0
1	TRP	8	0	0	1	100	0	0	0	0	0	0
1	STP	8	0	0	0	0	1	100	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1<2 Feet Max Resid. Depth	Total 1< 2 Feet % Occurrence	Total 2<3 Feet Max Resid. Depth	Total 2< 3 Feet % Occurrence	Total 3<4 Feet Max Resid. Depth	Total 3< 4 Feet % Occurrence	Total >=4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
12	0	0	3	25	5	42	2	17	2	17

Mean Maximum Residual Pool Depth (ft.): 3

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Salvador Creek **LLID:** 1222832383263 **Drainage:** Napa River

Survey Dates: 8/30/2007 to 8/31/2007

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:19:35.0N **Longitude:** 122:16:60.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
33	5	LGR	0	0	0	0	0	2	0	18	0
32	2	GLD	0	0	0	5	5	45	0	45	0
1	1	RUN	0	0	0	0	0	100	0	0	0
1	1	TRP	0	40	0	20	40	0	0	0	0
30	8	MCP	21	18	3	13	18	26	0	3	0
1	1	STP	50	10	0	40	0	0	0	0	0
1	1	CRP	0	10	20	30	20	20	0	0	0
2	1	LSR	30	70	0	0	0	0	0	0	0
5	0	CUL									
1	0	NS									

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Salvador Creek **LLID:** 1222832383263 **Drainage:** Napa River

Survey Dates: 8/30/2007 to 8/31/2007

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:19:35.0N **Longitude:** 122:16:60.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
33	5	LGR	0	0	60	0	20	20	0
32	2	GLD	0	0	100	0	0	0	0
1	1	RUN	0	0	100	0	0	0	0
1	1	TRP	100	0	0	0	0	0	0
30	8	MCP	63	0	38	0	0	0	0
1	1	STP	0	0	100	0	0	0	0
1	1	CRP	100	0	0	0	0	0	0
2	1	LSR	100	0	0	0	0	0	0
5	0	CUL	0	0	0	0	0	0	0
1	0	NS	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Salvador Creek **LLID:** 1222832383263 **Drainage:** Napa River

Survey Dates: 8/30/2007 to 8/31/2007

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:19:35.0N **Longitude:** 122:16:60.0W

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
76	1	99	0	83	84

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Salvador Creek LLID: 1222832383263 Drainage: Napa River
Survey Dates: 8/30/2007 to 8/31/2007 Survey Length (ft.): 8864 Main Channel (ft.): 8864 Side Channel (ft.): 0
Confluence Location: Quad: NAPA Legal Description: T000R000S00 Latitude: 38:19:35.0N Longitude: 122:16:60.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type:
Reach Length (ft.): 8864
Riffle/Flatwater Mean Width (ft.): 9.4
BFW:
Range (ft.): 17.799 to 17.7999
Mean (ft.): 17.8
Std. Dev.: 3.07913416985883E-15
Base Flow (cfs): 0
Water (F): 67 - 75 Air (F): 77 - 95
Dry Channel (ft.): 390

Canopy Density (%): 76.4
Coniferous Component (%): 1.4
Hardwood Component (%): 98.6
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 83.4
Dominant Shelter: Aquatic Vegetation
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 2.0
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 40.1
Pool Frequency (%): 30.7
Residual Pool Depth (%):
< 2 Feet Deep: 25.0
2 to 2.9 Feet Deep: 41.7
3 to 3.9 Feet Deep: 16.7
>= 4 Feet Deep: 16.7
Mean Max Residual Pool Depth (ft.): 2.595
Mean Pool Shelter Rating: 76

Pool Tail Substrate (%): Silt/Clay: 33.3 Sand: 0.0 Gravel: 41.7 Sm Cobble: 8.3 Lg Cobble: 0.0 Boulder: 16.7 Bedrock: 0.0
Embeddedness Values (%): 1. 0.0 2. 16.7 3. 16.7 4. 16.7 5. 50.0

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Salvador Creek **LLID:** 1222832383263 **Drainage:** Napa River

Survey Dates: 8/30/2007 to 8/31/2007

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:19:35.0N **Longitude:** 122:16:60.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	0	0	0.0
Boulder	3	0	7.5
Cobble/Gravel	0	0	0.0
Sand/Silt/Clay	17	20	92.5

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Grass	1	4	12.5
Brush	13	13	65.0
Hardwood Trees	6	3	22.5
Coniferous Trees	0	0	0.0
No Vegetation	0	0	0.0

Total Stream Cobble Embeddedness Values: 4

Table 10 - Mean Percent of Shelter Cover Types For Entire System

Stream Name: Salvador Creek **LLID:** 1222832383263 **Drainage:** Napa River

Survey Dates: 8/30/2007 to 8/31/2007

Confluence Location: **Quad:** NAPA **Legal Description:** T000R000S00 **Latitude:** 38:19:35.0N **Longitude:** 122:16:60.0W

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	20
SMALL WOODY DEBRIS (%)	0	0	23
LARGE WOODY DEBRIS (%)	0	0	3
ROOT MASS (%)	0	3	16
TERRESTRIAL VEGETATION (%)	0	3	17
AQUATIC VEGETATION (%)	2	63	19
WHITEWATER (%)	0	0	0
BOULDERS (%)	18	30	2
BEDROCK LEDGES (%)	0	0	0

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Suscol Creek **LLID:** 1222856382395 **Drainage:** Napa River

Survey Dates: 10/15/2007 to 10/22/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:14:22.0N **Longitude:** 122:17:08.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating
2	0	CULVERT	1.3	93	186	1.3									
3	0	DRY	1.9	1245	3736	25.9									
44	8	FLATWATER	27.8	45	1962	13.6	6.6	0.5	0.8	381	16770	182	8004		27
3	0	NOSURVEY	1.9	870	2609	18.1									
1	0	NOSURVEY_ MARSH	0.6	2040	2040	14.1									
47	21	POOL	29.7	47	2207	15.3	8.6	1.1	1.8	467	21946	765	35958	686	85
58	9	RIFFLE	36.7	29	1697	11.8	4.0	0.2	0.4	142	8223	20	1143		16

Table 1 - Summary of Riffle, Flatwater, and Pool Habitat Types

Stream Name: Suscol Creek **LLID:** 1222856382395 **Drainage:** Napa River

Survey Dates: 10/15/2007 to 10/22/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:14:22.0N **Longitude:** 122:17:08.0W

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
158	38	14437	46938	45105

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Suscol Creek **LLID:** 1222856382395 **Drainage:** Napa River

Survey Dates: 10/15/2007 to 10/22/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:14:22.0N **Longitude:** 122:17:08.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Depth (ft.)	Mean Max Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq.ft.)	Mean Volume (cu.ft.)	Estimated Total Volume (cu.ft.)	Mean Residual Pool Vol (cu.ft.)	Mean Shelter Rating	Mean Canopy (%)
49	6	LGR	31.0	31	1529	10.6	5.0	0.1	0.6	182	8902	23	1144		24	85
1	1	HGR	0.6	20	20	0.1	4.0	0.2	0.4	80	80	16	16		0	97
8	2	BRS	5.1	18	148	1.0	2.0	0.2	0.5	53	424	11	85		0	90
28	5	GLD	17.7	40	1124	7.8	8.0	0.5	1.0	448	12538	192	5364		28	89
1	1	RUN	0.6	21	21	0.1	4.0	0.3	0.7	84	84	25	25		0	95
15	2	SRN	9.5	54	817	5.7	4.0	0.5	0.9	363	5445	236	3542		38	97
3	1	TRP	1.9	42	126	0.9	3.0	1.7	2.5	153	459	306	918	260	100	52
32	9	MCP	20.3	46	1475	10.2	9.0	1.1	2.4	503	16103	761	24337	663	74	78
3	2	STP	1.9	96	289	2.0	10.0	1.4	3.5	1037	3111	2013	6039	1822	98	97
2	2	CRP	1.3	67	134	0.9	14.0	2.0	3.7	900	1800	1855	3710	1790	165	70
3	3	LSR	1.9	32	95	0.7	6.0	0.8	1.5	196	587	220	661	175	73	67
1	1	LSBk	0.6	18	18	0.1	8.0	0.4	0.6	144	144	86	86	58	10	100
1	1	LSBo	0.6	18	18	0.1	7.0	0.4	1.1	126	126	88	88	50	150	97
2	2	PLP	1.3	26	52	0.4	8.0	0.8	1.7	197	393	172	345	164	55	90
3	0	DRY	1.9	1245	3736	25.9										
2	0	CUL	1.3	93	186	1.3										
3	0	NS	1.9	870	2609	18.1										
1	0	MAR	0.6	2040	2040	14.1										

Table 2 - Summary of Habitat Types and Measured Parameters

Stream Name: Suscol Creek **LLID:** 1222856382395 **Drainage:** Napa River

Survey Dates: 10/15/2007 to 10/22/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:14:22.0N **Longitude:** 122:17:08.0W

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
158	38	14437	50196	46359

Table 3 - Summary of Pools

Stream Name: Suscol Creek **LLID:** 1222856382395 **Drainage:** Napa River

Survey Dates: 10/15/2007 to 10/22/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:14:22.0N **Longitude:** 122:17:08.0W

Habitat Units	Units Fully Measured	Habitat Type	Habitat Occurrence (%)	Mean Length (ft.)	Total Length (ft.)	Total Length (%)	Mean Width (ft.)	Mean Residual Depth (ft.)	Mean Area (sq.ft.)	Estimated Total Area (sq. ft.)	Mean Residual Pool Vol (cu.ft.)	Estimated Total Resid. Vol (cu.ft.)	Mean Shelter Rating
38	12	MAIN	81	50	1890	86	9.0	1.2	563	21394	823	31269	80
9	9	SCOUR	19	35	317	14	8.2	1.0	339	3050	504	4540	91

Total Units	Total Units Fully Measured	Total Length (ft.)	Total Area (sq.ft.)	Total Volume (cu.ft.)
47	21	2207	24444	35809

Table 4 - Summary of Maximum Residual Pool Depths By Pool

Stream Name: Suscol Creek **LLID:** 1222856382395 **Drainage:** Napa River

Survey Dates: 10/15/2007 to 10/22/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:14:22.0N **Longitude:** 122:17:08.0W

Habitat Units	Habitat Type	Habitat Occurrence (%)	< 1 Foot Maximum Residual Depth	< 1 Foot Percent Occurrence	1 < 2 Feet Maximum Residual Depth	1 < 2 Feet Percent Occurrence	2 < 3 Feet Maximum Residual Depth	2 < 3 Feet Percent Occurrence	3 < 4 Feet Maximum Residual Depth	3 < 4 Feet Percent Occurrence	>= 4 Feet Maximum Residual Depth	>= 4 Feet Percent Occurrence
9	MCP	43	1	11	4	44	4	44	0	0	0	0
2	CRP	10	0	0	0	0	1	50	1	50	0	0
2	STP	10	0	0	1	50	0	0	1	50	0	0
1	LSBo	5	0	0	1	100	0	0	0	0	0	0
1	TRP	5	0	0	0	0	1	100	0	0	0	0
3	LSR	14	0	0	3	100	0	0	0	0	0	0
2	PLP	10	0	0	2	100	0	0	0	0	0	0
1	LSBk	5	1	100	0	0	0	0	0	0	0	0

Total Units	Total < 1 Foot Max Resid. Depth	Total < 1 Foot % Occurrence	Total 1<2 Feet Max Resid. Depth	Total 1< 2 Feet % Occurrence	Total 2<3 Feet Max Resid. Depth	Total 2< 3 Feet % Occurrence	Total 3<4 Feet Max Resid. Depth	Total 3< 4 Feet % Occurrence	Total >=4 Feet Max Resid. Depth	Total >= 4 Feet % Occurrence
21	2	10	11	52	6	29	2	10	0	0

Mean Maximum Residual Pool Depth (ft.): 2

Table 5 - Summary of Mean Percent Cover By Habitat Type

Stream Name: Suscol Creek **LLID:** 1222856382395 **Drainage:** Napa River

Survey Dates: 10/15/2007 to 10/22/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:14:22.0N **Longitude:** 122:17:08.0W

Habitat Units	Units Fully Measured	Habitat Type	Mean % Undercut Banks	Mean % SWD	Mean % LWD	Mean % Root Mass	Mean % Terr. Vegetation	Mean % Aquatic Vegetation	Mean % White Water	Mean % Boulders	Mean % Bedrock Ledges
49	6	LGR	0	4	0	2	31	3	0	43	0
1	1	HGR	0	0	0	0	0	0	0	0	0
8	2	BRS	0	0	0	0	0	0	0	0	0
28	5	GLD	0	3	0	21	6	16	0	54	0
1	1	RUN	0	0	0	0	0	0	0	0	0
15	2	SRN	0	10	0	15	38	0	0	38	0
3	1	TRP	30	0	0	0	50	0	0	20	0
32	9	MCP	2	11	3	19	20	16	0	30	0
3	2	STP	0	20	0	30	20	5	0	25	0
2	2	CRP	25	0	0	15	20	25	0	5	10
3	3	LSR	7	10	23	50	0	0	0	10	0
1	1	LSBk	0	0	0	0	0	0	0	100	0
1	1	LSBo	20	0	0	20	0	30	0	30	0
2	2	PLP	0	30	0	55	0	0	0	15	0
2	0	CUL									
3	0	NS									
1	0	MAR									

Table 6 - Summary of Dominant Substrates By Habitat Type

Stream Name: Suscol Creek **LLID:** 1222856382395 **Drainage:** Napa River

Survey Dates: 10/15/2007 to 10/22/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:14:22.0N **Longitude:** 122:17:08.0W

Habitat Units	Units Fully Measured	Habitat Type	% Total Silt/Clay Dominant	% Total Sand Dominant	% Total Gravel Dominant	% Total Small Cobble Dominant	% Total Large Cobble Dominant	% Total Boulder Dominant	% Total Bedrock Dominant
49	6	LGR	0	0	50	0	50	0	0
1	1	HGR	0	100	0	0	0	0	0
8	2	BRS	0	0	0	0	0	50	50
28	5	GLD	0	0	40	40	20	0	0
1	1	RUN	0	0	0	0	0	0	100
15	2	SRN	0	0	0	50	0	50	0
3	1	TRP	0	0	0	0	0	100	0
32	9	MCP	44	22	22	11	0	0	0
3	2	STP	100	0	0	0	0	0	0
2	2	CRP	0	0	0	0	100	0	0
3	3	LSR	33	0	33	33	0	0	0
1	1	LSBk	0	100	0	0	0	0	0
1	1	LSBo	0	0	0	0	0	0	100
2	2	PLP	50	0	50	0	0	0	0
2	0	CUL	0	0	0	0	0	0	0
3	0	NS	0	0	0	0	0	0	0
1	0	MAR	0	0	0	0	0	0	0

Table 7 - Summary of Mean Percent Canopy for Entire Stream

Stream Name: Suscol Creek **LLID:** 1222856382395 **Drainage:** Napa River

Survey Dates: 10/15/2007 to 10/22/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:14:22.0N **Longitude:** 122:17:08.0W

Habitat Units	Mean Percent Conifer	Mean Percent Hardwood	Mean Percent Open Units	Mean Right Bank % Cover	Mean Left Bank % Cover
85	0	100	0	76	74

Note: Mean percent conifer and hardwood for the entire reach are means of canopy components from units with canopy values greater than zero.

Open units represent habitat units with zero canopy cover.

Table 8 - Fish Habitat Inventory Data Summary

Stream Name: Suscol Creek LLID: 1222856382395 Drainage: Napa River
Survey Dates: 10/15/2007 to 10/22/2007 Survey Length (ft.): 14437 Main Channel (ft.): 14437 Side Channel (ft.): 0
Confluence Location: Quad: MT. GEORGE Legal Description: T000R000S00 Latitude: 38:14:22.0N Longitude: 122:17:08.0W

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 1

Channel Type: f4
Reach Length (ft.): 2040
Riffle/Flatwater Mean Width (ft.):
BFW:
Range (ft.): 18 to 18
Mean (ft.): 18
Std. Dev.: 0
Base Flow (cfs): 0
Water (F): 55 - 55 Air (F): 61 - 61
Dry Channel (ft.): 0

Canopy Density (%):
Coniferous Component (%):
Hardwood Component (%):
Dominant Bank Vegetation:
Vegetative Cover (%): 0.0
Dominant Shelter:
Dominant Bank Substrate Type:
Occurrence of LWD (%):
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 0.0
Pool Frequency (%): 0.0
Residual Pool Depth (%):
< 2 Feet Deep:
2 to 2.9 Feet Deep:
3 to 3.9 Feet Deep:
>= 4 Feet Deep:
Mean Max Residual Pool Depth (ft.):
Mean Pool Shelter Rating:

Pool Tail Substrate (%): Silt/Clay: Sand: Gravel: Sm Cobble: Lg Cobble: Boulder: Bedrock:
Embeddedness Values (%): 1. 2. 3. 4. 5. 0.0

STREAM REACH: 2

Channel Type:
Reach Length (ft.): 2848
Riffle/Flatwater Mean Width (ft.):
BFW:
Range (ft.): 18 to 18
Mean (ft.): 18
Std. Dev.: 0
Base Flow (cfs): 0
Water (F): 55 - 55 Air (F): 61 - 61
Dry Channel (ft.): 2848

Canopy Density (%):
Coniferous Component (%):
Hardwood Component (%):
Dominant Bank Vegetation:
Vegetative Cover (%): 0.0
Dominant Shelter:
Dominant Bank Substrate Type:
Occurrence of LWD (%):
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 0.0
Pool Frequency (%): 0.0
Residual Pool Depth (%):
< 2 Feet Deep:
2 to 2.9 Feet Deep:
3 to 3.9 Feet Deep:
>= 4 Feet Deep:
Mean Max Residual Pool Depth (ft.):
Mean Pool Shelter Rating:

Pool Tail Substrate (%): Silt/Clay: Sand: Gravel: Sm Cobble: Lg Cobble: Boulder: Bedrock:
Embeddedness Values (%): 1. 2. 3. 4. 5. 0.0

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 3

Channel Type: B4
Reach Length (ft.): 4674
Riffle/Flatwater Mean Width (ft.): 4.7
BFW:
Range (ft.): 18 to 18
Mean (ft.): 18
Std. Dev.: 0
Base Flow (cfs): 0.1
Water (F): 55 - 56 Air (F): 59 - 64
Dry Channel (ft.): 0

Canopy Density (%): 84.9
Coniferous Component (%): 0.0
Hardwood Component (%): 100.0
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 81.3
Dominant Shelter: Terrestrial Veg.
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 0.0
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 19.8
Pool Frequency (%): 33.9
Residual Pool Depth (%):
< 2 Feet Deep: 55.6
2 to 2.9 Feet Deep: 33.3
3 to 3.9 Feet Deep: 11.1
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.9
Mean Pool Shelter Rating: 104

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 60.0 Sm Cobble: 10.0 Lg Cobble: 20.0 Boulder: 10.0 Bedrock: 0.0
Embeddedness Values (%): 1. 70.0 2. 10.0 3. 10.0 4. 0.0 5. 10.0

STREAM REACH: 4

Channel Type: NA
Reach Length (ft.): 780
Riffle/Flatwater Mean Width (ft.):
BFW:
Range (ft.): 18 to 18
Mean (ft.): 18
Std. Dev.: 0
Base Flow (cfs): 0.25
Water (F): 55 - 55 Air (F): 64 - 64
Dry Channel (ft.): 780

Canopy Density (%):
Coniferous Component (%):
Hardwood Component (%):
Dominant Bank Vegetation:
Vegetative Cover (%): 0.0
Dominant Shelter:
Dominant Bank Substrate Type:
Occurrence of LWD (%):
LWD per 100 ft.:
Riffles:
Pools:
Flat:

Pools by Stream Length (%): 0.0
Pool Frequency (%): 0.0
Residual Pool Depth (%):
< 2 Feet Deep:
2 to 2.9 Feet Deep:
3 to 3.9 Feet Deep:
>= 4 Feet Deep:
Mean Max Residual Pool Depth (ft.):
Mean Pool Shelter Rating:

Pool Tail Substrate (%): Silt/Clay: Sand: Gravel: Sm Cobble: Lg Cobble: Boulder: Bedrock:
Embeddedness Values (%): 1. 2. 3. 4. 5. 0.0

Summary of Fish Habitat Elements By Stream Reach

STREAM REACH: 5

Channel Type: C2
Reach Length (ft.): 4095
Riffle/Flatwater Mean Width (ft.): 5.6
BFW:
Range (ft.): 18 to 26.5
Mean (ft.): 20.2979797979798
Std. Dev.: 2.60818369395449
Base Flow (cfs): 0.25
Water (F): 55 - 61 Air (F): 63 - 75
Dry Channel (ft.): 108

Canopy Density (%): 84.9
Coniferous Component (%): 0.0
Hardwood Component (%): 100.0
Dominant Bank Vegetation: Brush
Vegetative Cover (%): 70.6
Dominant Shelter: Boulders
Dominant Bank Substrate Type: Sand/Silt/Clay
Occurrence of LWD (%): 4.3
LWD per 100 ft.:
Riffles: 0
Pools: 0
Flat: 0

Pools by Stream Length (%): 31.3
Pool Frequency (%): 28.3
Residual Pool Depth (%):
< 2 Feet Deep: 66.7
2 to 2.9 Feet Deep: 25.0
3 to 3.9 Feet Deep: 8.3
>= 4 Feet Deep: 0.0
Mean Max Residual Pool Depth (ft.): 1.6875
Mean Pool Shelter Rating: 70

Pool Tail Substrate (%): Silt/Clay: 0.0 Sand: 0.0 Gravel: 66.7 Sm Cobble: 8.3 Lg Cobble: 16.7 Boulder: 8.3 Bedrock: 0.0
Embeddedness Values (%): 1. 25.0 2. 8.3 3. 50.0 4. 0.0 5. 16.7

Table 9 -Mean Percentage of Dominant Substrate and Vegetation

Stream Name: Suscol Creek **LLID:** 1222856382395 **Drainage:** Napa River

Survey Dates: 10/15/2007 to 10/22/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:14:22.0N **Longitude:** 122:17:08.0W

Mean Percentage of Dominant Stream Bank Substrate

Dominant Class of Substrate	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Bedrock	5	3	10.5
Boulder	7	7	18.4
Cobble/Gravel	7	9	21.1
Sand/Silt/Clay	19	19	50.0

Mean Percentage of Dominant Stream Bank Vegetation

Dominant Class of Vegetation	Number of Units Right Bank	Number of Units Left Bank	Total Mean Percentage (%)
Grass	2	1	3.9
Brush	20	23	56.6
Hardwood Trees	16	13	38.2
Coniferous Trees	0	0	0.0
No Vegetation	0	1	1.3

Total Stream Cobble Embeddedness Values: 2

Table 10 - Mean Percent of Shelter Cover Types For Entire System

Stream Name: Suscol Creek **LLID:** 1222856382395 **Drainage:** Napa River

Survey Dates: 10/15/2007 to 10/22/2007

Confluence Location: **Quad:** MT. GEORGE **Legal Description:** T000R000S00 **Latitude:** 38:14:22.0N **Longitude:** 122:17:08.0W

	Riffles	Flatwater	Pools
UNDERCUT BANKS (%)	0	0	7
SMALL WOODY DEBRIS (%)	3	4	11
LARGE WOODY DEBRIS (%)	0	0	5
ROOT MASS (%)	1	17	26
TERRESTRIAL VEGETATION (%)	21	13	15
AQUATIC VEGETATION (%)	2	10	11
WHITEWATER (%)	0	0	0
BOULDERS (%)	29	43	26
BEDROCK LEDGES (%)	0	0	1