

CALIFORNIA DEPARTMENT OF FISH AND GAME  
STREAM INVENTORY REPORT  
Kidd Creek  
*Report Revised April 14, 2006*  
*Report Completed 2005*  
*Assessment Completed 2001*

INTRODUCTION

A stream inventory was conducted July 6 to July 12, 2001 on Kidd Creek. The survey began at the confluence with Austin Creek and extended upstream 9,683 feet.

The Kidd Creek inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the habitat available to anadromous salmonids in Kidd Creek. The objective of the biological inventory was to document the presence and distribution of juvenile salmonid species.

The objective of this report is to document the current habitat conditions and recommend options for the potential enhancement of habitat for Chinook salmon, coho salmon, and steelhead trout. Recommendations for habitat improvement activities are based upon target habitat values suitable for salmonids in California's north coast streams.

WATERSHED OVERVIEW

Kidd Creek is a tributary to Austin Creek, is a tributary to Russian River, a tributary to Pacific Ocean, located in Sonoma County, California (Map 1). Kidd Creek's legal description at the confluence with Austin Creek is T08N R11W S34. Its location is 38°29'44" north latitude and 123°04'06" west longitude, LLID number 1230682384956. Kidd Creek is a third order stream and has approximately 2.78 miles of blue line stream according to the USGS Cazadero and Duncan's Mills 7.5 minute quadrangles. Kidd Creek drains a watershed of approximately 3.05 square miles. Elevations range from about 30 feet at the mouth of the creek to 2198 feet in the headwater areas. Mixed hardwood/conifer forest dominates the watershed. The watershed is entirely privately owned. Kidd Creek was historically inhabited by Coho (*O. Kysutch*) and Steelhead Trout (*O. Mykiss*). Threatened and endangered species in the Kidd Creek watershed include the red tree vole (*Arborimus pomo*) and the California freshwater shrimp (*Syncaris pacifica*). Vehicle access exists via Highway 1 to Highway 116 near Jenner. Follow Highway 116 approximately 4.7 miles east, to Cazadero Road. Follow Cazadero Road approximately 2.7 miles north, to the mouth of Kidd Creek.

## METHODS

The habitat inventory conducted in Kidd Creek follows the methodology presented in the *California Salmonid Stream Habitat Restoration Manual* (Flosi et al., 1998). The California Department of Fish and Game field crew and/or the Watershed Stewards Project/AmeriCorps (WSP/AmeriCorps) Members that conducted the inventory were trained in standardized habitat inventory methods by the California Department of Fish and Game (DFG). This inventory was conducted by a two-person team.

## SAMPLING STRATEGY

The inventory uses a method that samples approximately 10% of the habitat units within the survey reach. All habitat units included in the survey are classified according to habitat type and their lengths are measured. All pool units are measured for maximum depth, depth of pool tail crest (measured in the thalweg), dominant substrate composing the pool tail crest, and embeddedness. Habitat unit types encountered for the first time are 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.

## 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*. This form was used in Kidd Creek to record measurements and observations. There are nine components to the inventory form.

### 1. Flow:

Flow is measured in cubic feet per second (cfs) at the bottom of the stream survey reach using a Marsh-McBirney Model 2000 flow meter.

### 2. Channel Type:

Channel typing is conducted according to the classification system developed and revised by David Rosgen (1985 rev. 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 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. Temperatures were also recorded using remote temperature recorders, which log temperatures at set intervals, 24 hours/day.

### 4. Habitat Type:

Habitat typing uses the 24 habitat classification types defined by McCain and others (1988). 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". Kidd Creek 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 Kidd Creek, embeddedness was 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 particle size, bedrock, or other considerations.

### 6. Shelter Rating:

Instream shelter is composed of those elements within a stream channel that provide 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. 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. In Kidd Creek, 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 pool.

## 8. Canopy:

Stream canopy density was estimated using modified handheld spherical densimeters as described in the *California Salmonid Stream Habitat Restoration Manual*. Canopy density relates to the amount of stream shaded from the sun. In Kidd Creek, 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 estimated ocularly into percentages of evergreen or deciduous 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. In Kidd Creek, 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.

## BIOLOGICAL INVENTORY

Biological sampling during the stream inventory is used to determine fish species and their distribution in the stream. Fish presence was observed from the stream banks in Kidd Creek. In addition, two sites were electrofished using a Smith-Root Model 12 electrofisher. These sampling techniques are discussed in the *California Salmonid Stream Habitat Restoration Manual*.

## DATA ANALYSIS

Data from the habitat inventory form are entered into Habitat, a dBASE IV data entry program developed by CDFG. This program processes and summarizes the data, and produces the following tables and appendices:

- 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

Graphics are produced from the tables using Microsoft Excel. Graphics developed for Kidd Creek include:

- 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

## HABITAT INVENTORY RESULTS

\* ALL TABLES AND GRAPHS ARE LOCATED AT THE END OF THE REPORT \*

The habitat inventory of July 6, to July 12, 2001, was conducted by J. MacTague and J. Willing (WSP). The total length of the stream surveyed was 9,683 feet.

Stream flow was not measured on Kidd Creek

Kidd Creek is an F4 channel type for 2,677 feet, an F3 for 4,065 feet, a B2 for 986 feet, and an A2 for 1,670 feet of the stream surveyed. F4 channels are entrenched, meandering, riffle/pool channels on low gradients with high width/depth ratios and gravel-dominant substrates. F3 channels are entrenched, meandering, riffle/pool channels on low gradients with high width/depth ratios and cobble-dominant substrates. B2 channel are moderately entrenched, moderate gradient, riffle-dominated channels with infrequently spaced pool; very stable plan and profile, stable banks, and boulder-dominant substrates. A2 channel types are steep, narrow cascading, step-pool streams with high energy/debris transport associated with depositional soils and boulder-dominant substrates.

Water temperatures taken during the survey period ranged from 50 to 58 degrees Fahrenheit. Air temperatures ranged from 52 to 71 degrees Fahrenheit.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of occurrence there were 29% riffle units, 34% flatwater units, 33% pool units, and 4% dry units (Graph 1). Based on total length of Level II habitat types there were 23% riffle units, 47% flatwater units, 23% pool units, and 6% dry units (Graph 2).

Eighteen Level IV habitat types were identified (Table 2). The most frequent habitat types by percent occurrence were low gradient riffles, 20%; glides, 20%; and mid-channel pools, 9% (Graph 3). Based on percent total length, glides made up 26%, low gradient riffles 16%, and runs 11%.

A total of sixty pools were identified (Table 3). Scour pools were the most frequently encountered, at 67%, and comprised 64% of the total length of all pools (Graph 4).

Table 4 is a summary of maximum pool depths by pool habitat types. Pool quality for salmonids increases with depth. Forty-four of the 60 measured pools (73%) had a depth of two feet or greater (Graph 5).

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 60 pool tail-outs measured, 25 had a value of 1 (42%); 25 had a value of 2 (42%); 5 had a value of 3 (8%); none had a value of 4; and 5 had a value of 5 (8%), (Graph 6). On this scale, a value of 1 indicates the highest quality of spawning substrate.

A shelter rating was calculated for each habitat unit and expressed as a mean value for each habitat type within the survey using a scale of 0-300. Riffle habitat types had a mean shelter rating of 4, flatwater habitat types had a mean shelter rating of 11, and pool habitats had a mean shelter rating of 30 (Table 1). Of the pool types, the scour pools had the highest mean shelter rating at 30. Main-channel pools had a mean shelter rating of 29 (Table 3).

Table 5 summarizes mean percent cover by habitat type. Boulders are the dominant cover types in Kidd Creek. Graph 7 describes the pool cover in Kidd Creek. Boulders are the dominant pool cover type followed by roots.

Table 6 summarizes the dominant substrate by habitat type. Graph 8 depicts the dominant substrate observed in pool tail-outs. Gravel was the dominant substrate observed in 52% of pool tail-outs while small cobble was the next most frequently observed substrate type, at 31%.

The mean percent canopy density for the surveyed length of Kidd Creek was 77%. The mean percentages of evergreen and deciduous trees were 54% and 23%, respectively. Graph 9

describes the mean percent canopy in Kidd Creek.

For the stream reach surveyed, the mean percent right bank vegetated was 51%. The mean percent left bank vegetated was 58%. The dominant elements composing the structure of the stream banks consisted of 20% bedrock, 4% boulder, 11% cobble/gravel, and 65% sand/silt/clay (Graph 10). Brush was the dominant vegetation type observed in 53% of the units surveyed. Additionally, 25% of the units surveyed had evergreen trees as the dominant vegetation type, and 13% had deciduous trees as the dominant vegetation (Graph 11).

## BIOLOGICAL INVENTORY RESULTS

On 10/09/01 a biological inventory was conducted at site 1 on Kidd Creek to document fish species composition and distribution. The site, Lat. N 38°30'03.8", Long. W 123°05'15.0", was triple pass seine netted. Fish from the site were counted by species, and returned to the stream. The air temperature ranged from 55-60°F and the water temperature 49°F.

The inventory began at 12:00 hours in Reach 4 and ended at 14:56 hours. Habitat types surveyed were lateral scour pool - bedrock formed, mid-channel pools, runs and glides. The following table displays the information yielded from this site.

<b>Species Observed</b>	<b>Numbers Recorded at Site 1</b>
Steelhead YOY	10
Steelhead Y+	7
Steelhead 2+	5
Sculpin	5
Newt	1
Crawfish	2
Yellow-legged Frog	4

Site 2 on Kidd Creek, Lat. N 38°29'59.9", Long. W 123°4'31.1", was triple pass seine netted. Fish from the site were counted by species, and returned to the stream. The air temperature ranged from 60-62°F and the water temperature was 50°F.

The inventory began at 16:11 hours in Reach 3 and ended at 17:16 hours. Habitat types surveyed were lateral scour pool - bedrock formed, mid-channel pools, runs and glides. The following table displays the information yielded from this site.

<b>Species Observed</b>	<b>Numbers Recorded at Site 2</b>
Steelhead YOY	17
Steelhead Y+	7
Sculpin	27
Yellow-legged Frog	6
Crawfish	11
Sucker Fish	1

There is no record of hatchery stocking or fish rescue/transfer operations in Kidd Creek.

## DISCUSSION

Kidd Creek is an F4 channel type for 2,677 feet, an F3 for 4,065 feet, a B2 for 986 feet, and an A2 for 1,670 feet of stream surveyed. The suitability of F4, F3, B2, and A2 channel types for fish habitat improvement structures is as follows: F4 channel types are good for bank-placed boulders, fair for plunge weirs, single and opposing wing-deflectors, channel constrictors, and log cover; poor for boulder clusters. F3 channel types are good for bank-placed boulders and single and opposing wing-deflectors; fair for plunge weirs, boulder clusters, channel constrictors, and log cover. B2 channel types are excellent for plunge weirs, single and opposing wing-deflectors and log cover. A2 channel types are generally not suitable for fish habitat improvement structures.

The water temperatures recorded on the survey days July 6 to July 13, 2001, were within the suitable range for salmonids. To make any further conclusions, temperatures would need to be monitored throughout the warm summer months, and more extensive biological sampling would need to be conducted.

Riffle habitat types comprised 23% of the total length of this survey, flatwater 47%, and pools 23%. The pools are relatively deep, with 45 of the 60 (75%) measured pools having a maximum depth greater than two feet. In general, pool enhancement projects are considered when primary pools comprise less than 40% of the length of total stream habitat. In third order streams, a primary pool is defined to have a maximum depth of at least three feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. Installing structures that will increase or deepen pool habitat is recommended for locations where their installation will not be threatened by high stream energy, or where their installation will not conflict with the modification of the numerous log debris accumulations (LDA's) in the stream.

Fifty of the 60 pool tail-outs measured had embeddedness ratings of 1 or 2. Five of the pool tail-outs had embeddedness ratings of 3 or 4. None of the pool tail-outs had a rating of 5, which is considered unsuitable for spawning. Cobble embeddedness measured to be 25% or less, a rating of 1, is considered to indicate good quality spawning substrate for salmon and steelhead. Sediment sources in Kidd Creek should be mapped and rated according to their potential sediment yields, and control measures should be taken.



Fifty of the 60 pool tail-outs measured had gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

The mean shelter for flatwater was 4. The mean shelter rating for pools was 30. A pool shelter rating of approximately 100 is desirable. The amount of cover that now exists is being provided primarily by undercut banks in all habitat types. Additionally, boulders contribute a small amount. Log and root wad cover structures in the pool and flatwater habitats would enhance both summer and winter salmonid habitat. Log cover structure provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

The mean percent canopy density for the stream was 77%. Reach 1 had a canopy density of 89%, Reach 2, 70%, Reach 3, 65%, and Reach 4, 83%. In general, revegetation projects are considered when canopy density is less than 80%.

The percentage of right and left bank covered with vegetation was moderate at 51% and 58%, respectively. In areas of stream bank erosion or where bank vegetation is not at acceptable levels, planting endemic trees species, in conjunction with bank stabilization, is recommended.

## GENERAL MANAGEMENT RECOMMENDATIONS

Kidd Creek should be managed as an anadromous, natural production stream.

Winter storms often bring down large trees and other woody debris into the stream, which increases the number and quality of pools. This woody debris, if left undisturbed, will provide fish shelter and rearing habitat, and offset channel incision. Landowners should be sensitive about the natural and positive role woody debris plays in the system, and encouraged not to remove woody debris from the stream, except under extreme buildup and only under guidance by a fishery professional.

## RECOMMENDATIONS

- 1) Where feasible, design and engineer pool enhancement structures to increase the number of pools. This must be done where the banks are stable or in conjunction with stream bank armor to prevent erosion.
- 2) Increase woody cover in the pools and flatwater habitat units. Most of the existing cover is from boulders. Adding high quality complexity with log and root wad cover is desirable.
- 3) Inventory and map sources of stream bank erosion and prioritize them according to present and potential sediment yield. Identified sites should then be treated to reduce the amount of fine sediments entering the stream.
- 4) Active and potential sediment sources related to roads need to be identified, mapped, and treated according to their potential for sediment yield to the stream and its tributaries.
- 5) Increase the canopy on Kidd Creek by planting willow, alder, redwood, and Douglas fir along the stream where shade canopy is not at acceptable levels. The reaches above this survey section should be inventoried and treated as well, since the water flowing here is

affected from upstream. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects.

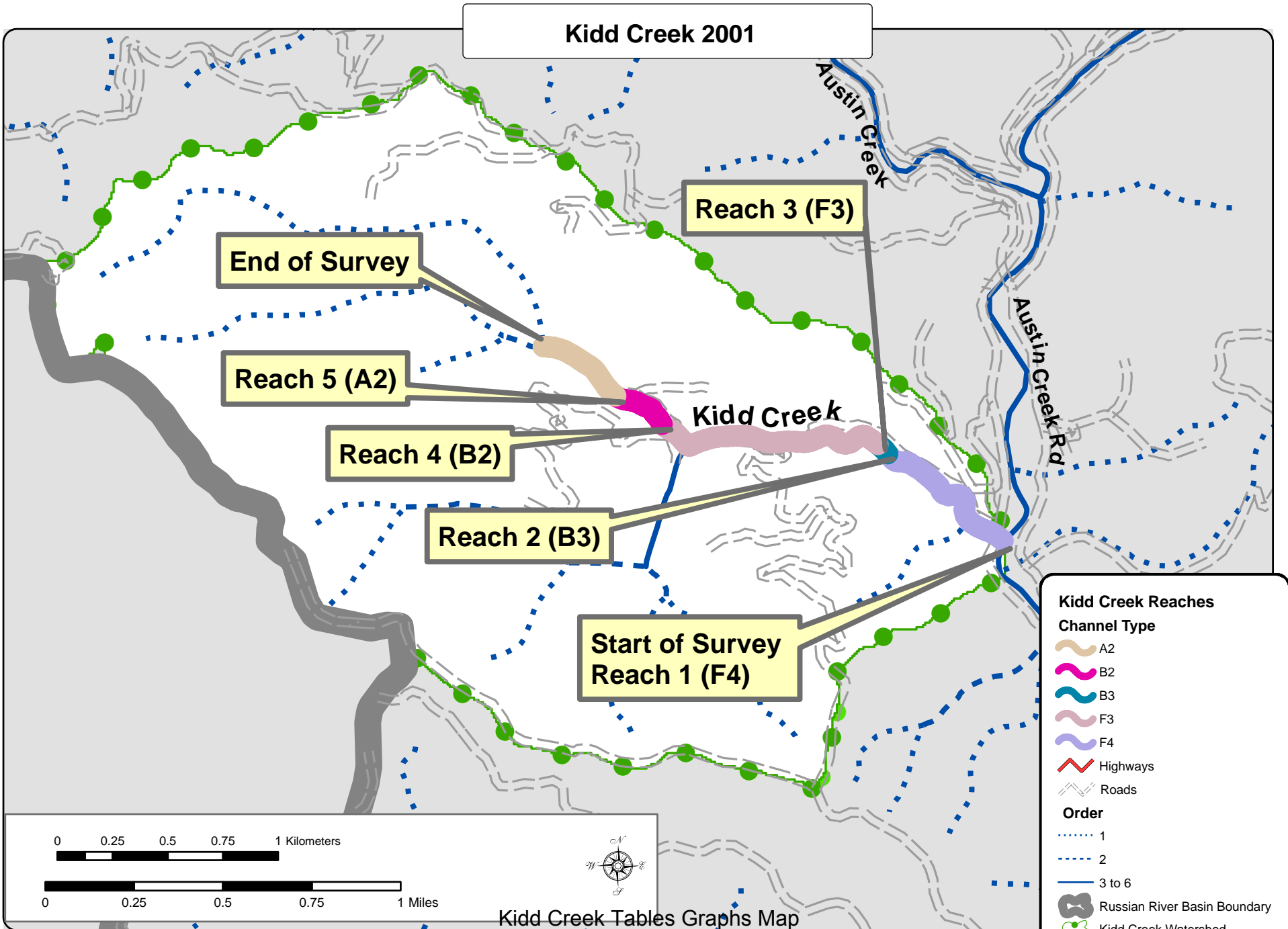
### COMMENTS AND LANDMARKS

The following landmarks and possible problem sites were noted. All distances are approximate and taken from the beginning of the survey.

0'	Begin survey
5455'	LWD Protocol (RW/3.0/10/C/3); Debris Accumulation
5537'	Culvert RB
5601'	LWD PROTOCOL (DF/3.0/20)
5789'	Road still continues on RB
5878'	Bridge at end of unit
5990'	Road crosses from RB to LB; LWD Protocol (RW/2.5/20)
6047'	Flag on RB
6340'	House on LB
6538'	Trib at end of unit RB (Clear Creek-52°)
6627'	2 bridges in unit-Cazanoma Lodge on RB
6899'	Trib on LB (Not surveyable) DRY
6935'	Cabins on LB and RB
7027'	Channel Change (F3----->B2)
7058'	Crayfish present
7163'	Dirt Rd LB
7208'	LB EROSION from road
7252'	Culvert w/ erosion 30'; Trib on LB (wet) too small
7356'	House on RB; Flashboard DAM at end of unit
7454'	Erosion on RB
7484'	House on RB
7515'	Flag on LB; SH YOY, YLF; RB will at 55' about 20 upslope
7590'	Water lower here. SH
7715'	LWD Protocol (DF/1.5/30/A/3)
8013'	Channel Type Change (B2----->A2)
8207'	Dry RB Trib at top of unit
8232'	Debris Accumulation -SEE FORM; LWD PROTOCOL (RWL/3.5/30/F/10); Newt
8241'	1+ SH; Property line marker at 86'; Accumulation at 62'-SEE FORM; LWD PROTOCOL (DF/1.0/10/B/6)
8640'	YLF, YOY, 3+ SH; LB 80' Bedrock seep
8841'	YLF
9366'	YOY here; Debris Accumulation -SEE FORM; LWD PROTOCOL (RWL/1.5/30/E/16)
9387'	LB Dry Trib at bottom of unit; wet trib mouth at top of unit (58°)
9512'	Accumulation at 23'-SEE FORM; LWD Protocol (DF/3/3.0/B/6)
9667'	END OF SURVEY - CASCADE

### REFERENCES

Flosi, G., Downie, S., Hopelain, J., Bird, M., Coey, R., and Collins, B. 1998. *California Salmonid Stream Habitat Restoration Manual*, 3rd edition. California Department of Fish and Game, Sacramento, California.



Kidd Creek Tables Graphs Map

Assessment Completed 2001

Prepared by: Celeste Dodge and Colin Brooks, March 24, 2005

APPENDIX B: TABLES

Kidd Creek

Drainage: RUSSIAN

Table 1 - SUMMARY OF RIFFLE, FLATWATER, AND POOL HABITAT TYPES

Survey Dates: 07/06/01 to 07/12/01

Confluence Location: QUAD: DUNCAN MIL LEGAL DESCRIPTION: T8NR11WS34 LATITUDE:38°29'44" LONGITUDE:123°4'6"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN AREA (sq.ft.)	ESTIMATED TOTAL AREA (sq.ft.)	MEAN ESTIMATED TOTAL VOLUME (cu.ft.)	ESTIMATED TOTAL VOLUME (cu.ft.)	MEAN RESIDUAL POOL VOL (cu.ft.)	MEAN SHELTER RATING
53	13	RIFFLE	29	43	2254	23	7.7	0.3	250	13239	79	4209	0	4
63	13	FLATWATER	34	73	4579	47	7.9	0.6	506	31871	309	19463	0	11
60	60	POOL	33	38	2262	23	11.2	1.2	435	26071	543	32573	434	30
7	0	DRY	4	84	589	6	0.0	0.0	0	0	0	0	0	0
<b>TOTAL UNITS</b>	<b>TOTAL UNITS</b>				<b>TOTAL LENGTH (ft.)</b>				<b>TOTAL AREA (sq. ft.)</b>		<b>TOTAL VOL. (cu. ft.)</b>			
183	86				9683				71182		56245			

Kidd Creek

Drainage: RUSSIAN

Table 2 - SUMMARY OF HABITAT TYPES AND MEASURED PARAMETERS

Survey Dates: 07/06/01 to 07/12/01

Confluence Location: QUAD: DUNCAN MIL LEGAL DESCRIPTION: T8NR11WS34 LATITUDE:38°29'44" LONGITUDE:123°4'6"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN MAXIMUM DEPTH (ft.)	MEAN AREA (sq.ft.)	TOTAL AREA (sq.ft.)	MEAN EST. TOTAL VOLUME (cu.ft.)	TOTAL EST. VOLUME (cu.ft.)	MEAN RESIDUAL POOL VOL (cu.ft.)	MEAN SHELTER RATING	MEAN CANOPY %
36	8	LGR	20	44	1586	16	10	0.3	0.6	317	11421	88	3182	0	2	72
6	1	HGR	3	65	392	4	8	0.4	0.7	75	449	30	179	0	0	93
7	2	CAS	4	20	140	1	2	0.4	1.1	87	609	35	244	0	15	74
4	2	BRS	2	34	137	1	5	0.5	1.1	230	921	113	452	0	3	67
36	5	GLD	20	71	2544	26	9	0.6	1.2	337	12123	215	7757	0	13	83
17	5	RUN	9	64	1093	11	7	0.5	1.8	663	11269	330	5618	0	10	80
10	3	SRN	5	94	941	10	8	0.7	1.2	526	5261	429	4288	0	10	75
1	1	TRP	1	19	19	0	5	4.2	5.0	86	86	359	359	351	20	60
16	16	MCP	9	39	621	6	11	1.0	3.7	479	7665	465	7440	327	30	79
1	1	CCP	1	53	53	1	23	1.0	2.0	1156	1156	1156	1156	1040	0	35
2	2	STP	1	62	124	1	12	0.9	2.9	657	1313	600	1201	434	40	93
5	5	CRP	3	56	281	3	8	1.1	3.3	464	2322	560	2802	399	29	68
5	5	LSL	3	41	206	2	12	0.9	3.5	494	2471	408	2038	291	45	80
13	13	LSR	7	33	426	4	10	0.9	3.3	330	4287	311	4045	250	41	78
3	3	LSBk	2	41	122	1	10	1.4	4.1	402	1205	538	1614	458	8	70
4	4	LSBo	2	49	195	2	12	1.3	3.4	610	2440	915	3661	756	13	71
10	10	PLP	5	21	214	2	13	1.9	6.0	313	3127	826	8258	743	21	79
7	0	DRY	4	84	589	6	0	0.0	0.0	0	0	0	0	0	0	83
<b>TOTAL UNITS</b>	<b>TOTAL UNITS</b>				<b>LENGTH (ft.)</b>					<b>AREA (sq.ft)</b>		<b>TOTAL VOL. (cu.ft)</b>				
183	86				9683					68124		54292				

Kidd Creek

Drainage: RUSSIAN

Table 3 - SUMMARY OF POOL TYPES

Survey Dates: 07/06/01 to 07/12/01

Confluence Location: QUAD: DUNCAN MIL LEGAL DESCRIPTION: T8NR11WS34 LATITUDE:38°29'44" LONGITUDE:123°4'6"

HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	MEAN LENGTH (ft.)	TOTAL LENGTH (ft.)	PERCENT TOTAL LENGTH	MEAN WIDTH (ft.)	MEAN DEPTH (ft.)	MEAN AREA (sq.ft.)	TOTAL AREA (sq.ft.)	MEAN VOLUME (cu.ft.)	TOTAL VOLUME (cu.ft.)	MEAN RESIDUAL POOL VOL. (cu.ft.)	MEAN SHELTER RATING
20	20	MAIN	33	41	818	36	11.7	1.2	511	10220	508	10155	375	29
40	40	SCOUR	67	36	1444	64	11.0	1.3	396	15851	560	22418	463	30
TOTAL UNITS	TOTAL UNITS				TOTAL LENGTH (ft.)				TOTAL AREA (sq.ft.)			TOTAL VOL. (cu.ft.)		
60	60				2262				26071			32573		

Kidd Creek

Drainage: RUSSIAN

Table 4 - SUMMARY OF MAXIMUM POOL DEPTHS BY POOL HABITAT TYPES

Survey Dates: 07/06/01 to 07/12/01

Confluence Location: QUAD: DUNCAN MIL LEGAL DESCRIPTION: T8NR11WS34 LATITUDE:38°29'44" LONGITUDE:123°4'6"

UNITS MEASURED	HABITAT TYPE	HABITAT PERCENT OCCURRENCE	<1 FOOT MAXIMUM DEPTH	<1 FOOT PERCENT OCCURRENCE	1-<2 FT. MAXIMUM DEPTH	1-<2 FOOT PERCENT OCCURRENCE	2-<3 FT. MAXIMUM DEPTH	2-<3 FOOT PERCENT OCCURRENCE	3-<4 FT. MAXIMUM DEPTH	3-<4 FOOT PERCENT OCCURRENCE	>=4 FEET MAXIMUM DEPTH	>=4 FEET PERCENT OCCURRENCE
1	TRP	2	0	0	0	0	0	0	0	0	1	100
16	MCP	27	0	0	5	31	9	56	2	13	0	0
1	CCP	2	0	0	0	0	1	100	0	0	0	0
2	STP	3	1	50	0	0	1	50	0	0	0	0
5	CRP	8	0	0	0	0	4	80	1	20	0	0
5	LSL	8	0	0	2	40	2	40	1	20	0	0
13	LSR	22	0	0	2	15	10	77	1	8	0	0
3	LSBk	5	0	0	0	0	2	67	0	0	1	33
4	LSBo	7	0	0	1	25	1	25	2	50	0	0
10	PLP	17	0	0	4	40	2	20	1	10	3	30

TOTAL UNITS  
60

Kidd Creek

Drainage: RUSSIAN

Table 5 - SUMMARY OF MEAN PERCENT COVER BY HABITAT TYPE

Survey Dates: 07/06/01 to 07/12/01

Confluence Location: QUAD: DUNCAN MIL LEGAL DESCRIPTION: T8NR11WS34 LATITUDE:38°29'44" LONGITUDE:123°4'6"

UNITS MEASURED	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
36	4	LGR	0	0	25	0	23	0	0	3	0
6	1	HGR	0	0	0	0	0	0	0	0	0
7	2	CAS	0	0	0	0	0	0	0	100	0
4	2	BRS	0	0	0	0	0	0	0	50	0
36	5	GLD	36	21	0	23	13	0	0	7	0
17	4	RUN	46	0	0	15	5	0	0	9	0
10	3	SRN	32	17	0	0	2	0	0	50	0
1	1	TRP	0	0	0	0	0	0	0	50	50
16	16	MCP	21	16	18	8	0	2	1	31	3
1	0	CCP	0	0	0	0	0	0	0	0	0
2	2	STP	13	0	0	35	3	0	0	40	10
5	5	CRP	23	16	12	13	2	0	0	34	0
5	5	LSL	32	10	29	29	0	0	0	0	0
13	13	LSR	18	14	8	60	0	0	0	0	0
3	3	LSbk	60	0	0	0	0	0	0	0	40
4	4	LSBo	0	0	5	13	0	0	0	83	0
10	10	PLP	2	0	10	10	0	0	7	55	17
7	0	DRY	0	0	0	0	0	0	0	0	0

Kidd Creek

Drainage: RUSSIAN

Table 6 - SUMMARY OF DOMINANT SUBSTRATES BY HABITAT TYPE

Survey Dates: 07/06/01 to 07/12/01

Confluence Location: QUAD: DUNCAN MIL LEGAL DESCRIPTION: T8NR11WS34 LATITUDE:38°29'44" LONGITUDE:123°4'6"

TOTAL HABITAT UNITS	UNITS FULLY MEASURED	HABITAT TYPE	% TOTAL SILT/CLAY DOMINANT	% TOTAL SAND DOMINANT	% TOTAL GRAVEL DOMINANT	% TOTAL SM COBBLE DOMINANT	% TOTAL LG COBBLE DOMINANT	% TOTAL BOULDER DOMINANT	% TOTAL BEDROCK DOMINANT
36	8	LGR	0	0	50	13	38	0	0
6	1	HGR	0	0	0	0	0	100	0
7	2	CAS	0	0	0	0	0	50	50
4	2	BRS	0	0	0	0	0	0	100
36	5	GLD	0	20	40	40	0	0	0
17	5	RUN	0	0	60	0	20	20	0
10	3	SRN	0	0	0	33	0	33	33
1	1	TRP	0	0	0	0	0	0	100
16	9	MCP	0	56	33	0	0	11	0
1	1	CCP	0	0	100	0	0	0	0
2	2	STP	0	0	50	0	0	0	50
5	2	CRP	0	50	50	0	0	0	0
5	3	LSL	0	0	100	0	0	0	0
13	8	LSR	0	38	50	13	0	0	0
3	2	LSbk	0	0	50	50	0	0	0
4	3	LSBo	0	33	33	33	0	0	0
10	6	PLP	0	17	33	0	50	0	0
7	1	DRY	0	0	100	0	0	0	0

APPENDIX C:

TABLE 8. FISH HABITAT INVENTORY DATA SUMMARY

STREAM NAME: Kidd Creek  
 SAMPLE DATES: 07/06/01 to 07/12/01  
 STREAM LENGTH: 9683 ft.  
 LOCATION OF STREAM MOUTH:  
     USGS Quad Map: DUNCAN MIL                      Latitude: 38°29'44"  
     Legal Description: T8NR11WS34                 Longitude: 123°4'6"

SUMMARY OF FISH HABITAT ELEMENTS BY STREAM REACH

STREAM REACH 1

Channel Type: F4	Canopy Density: 89%
Channel Length: 2677 ft.	Coniferous Component: 84%
Riffle/flatwater Mean Width: 8 ft.	Deciduous Component: 16%
Total Pool Mean Depth: 0.9 ft.	Pools by Stream Length: 21%
Base Flow: 0.0 cfs	Pools >=3 ft.deep: 0%
Water: 50 - 54 °F   Air: 52 -71 °F	Mean Pool Shelter Rtn: 19
Dom. Bank Veg.: Brush	Dom. Shelter: Root masses
Vegetative Cover: 68%	Occurrence of LOD: 4%
Dom. Bank Substrate: Silt/Clay/Sand	Dry Channel: 589 ft.

Embeddness Value: 1. 71%   2. 21%   3. 0%   4. 0%   5. 7%

STREAM REACH 2

Channel Type: F3	Canopy Density: 70%
Channel Length: 4065 ft.	Coniferous Component: 66%
Riffle/flatwater Mean Width: 10 ft.	Deciduous Component: 34%
Total Pool Mean Depth: 1.1 ft.	Pools by Stream Length: 29%
Base Flow: 0.0 cfs	Pools >=3 ft.deep: 30%
Water: 50 - 58 °F   Air: 54 -65 °F	Mean Pool Shelter Rtn: 37
Dom. Bank Veg.: Brush	Dom. Shelter: Root masses
Vegetative Cover: 59%	Occurrence of LOD: 24%
Dom. Bank Substrate: Silt/Clay/Sand	Dry Channel: 0 ft.

Embeddness Value: 1. 30%   2. 59%   3. 11%   4. 0%   5. 0%

STREAM REACH 3

Channel Type: B2	Canopy Density: 65%
Channel Length: 986 ft.	Coniferous Component: 69%
Riffle/flatwater Mean Width: 8 ft.	Deciduous Component: 31%
Total Pool Mean Depth: 1.6 ft.	Pools by Stream Length: 18%
Base Flow: 0.0 cfs	Pools >=3 ft.deep: 20%
Water: 52 - 56 °F   Air: 58 -60 °F	Mean Pool Shelter Rtn: 30
Dom. Bank Veg.: Brush	Dom. Shelter: Boulders
Vegetative Cover: 59%	Occurrence of LOD: 3%
Dom. Bank Substrate: Silt/Clay/Sand	Dry Channel: 0 ft.

Embeddness Value: 1. 40%   2. 60%   3. 0%   4. 0%   5. 0%

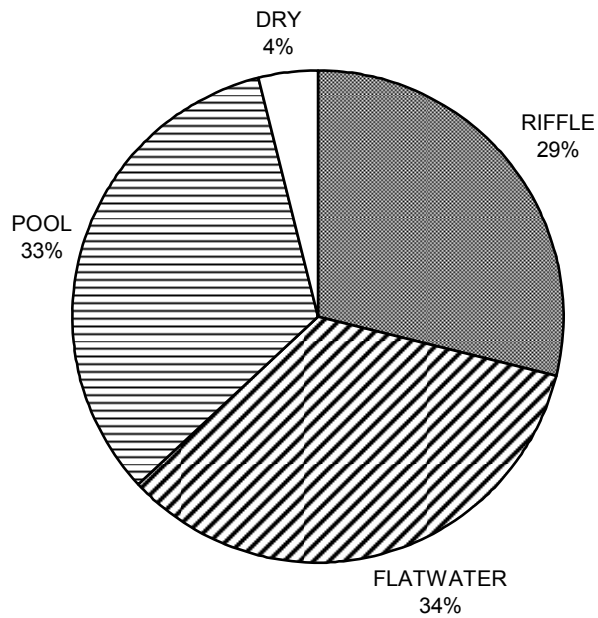
STREAM REACH 4

Channel Type: A2	Canopy Density: 83%
Channel Length: 1670 ft.	Coniferous Component: 57%
Riffle/flatwater Mean Width: 5 ft.	Deciduous Component: 41%
Total Pool Mean Depth: 1.7 ft.	Pools by Stream Length: 20%
Base Flow: 0.0 cfs	Pools >=3 ft.deep: 29%
Water: 52 - 58 °F   Air: 58 -64 °F	Mean Pool Shelter Rtn: 28
Dom. Bank Veg.: Brush	Dom. Shelter: Boulders

Vegetative Cover: 20%      Occurrence of LOD: 2%  
Dom. Bank Substrate: Silt/Clay/Sand      Dry Channel: 0 ft.  
Embeddness Value: 1. 36%    2. 21%    3. 14%    4. 0%    5. 29%

APPENDIX D: GRAPHS

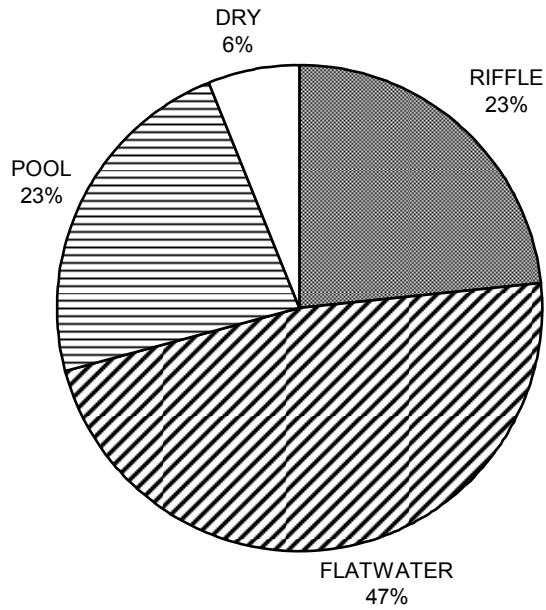
**KIDD CREEK**  
**LEVEL II HABITAT TYPES BY PERCENT OCCURRENCE**



GRAPH 1

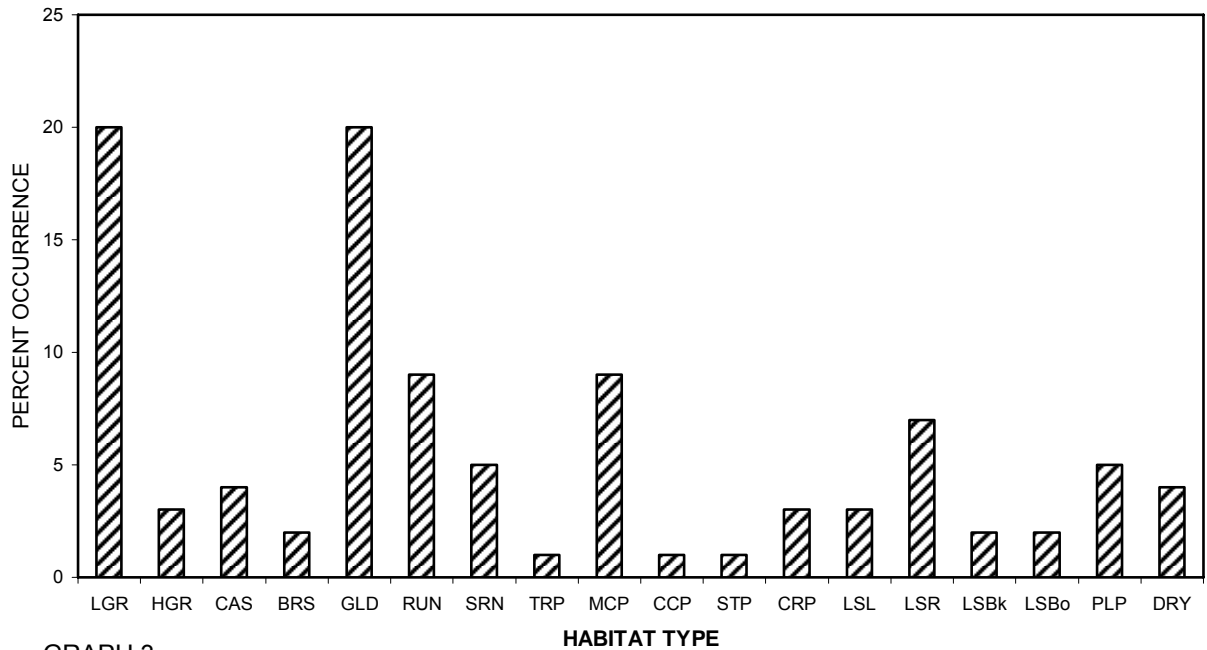


## KIDD CREEK LEVEL II HABITAT TYPES BY PERCENT TOTAL LENGTH



GRAPH 2

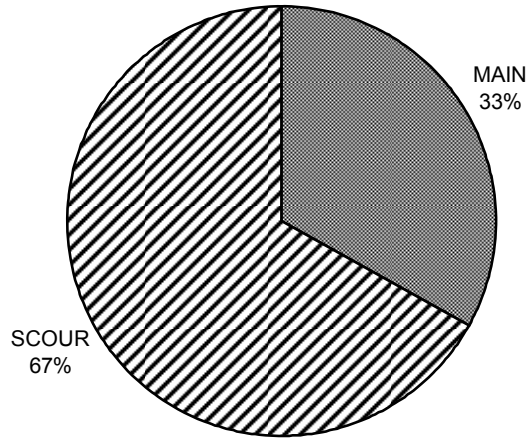
## KIDD CREEK LEVEL IV HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 3

# KIDD CREEK

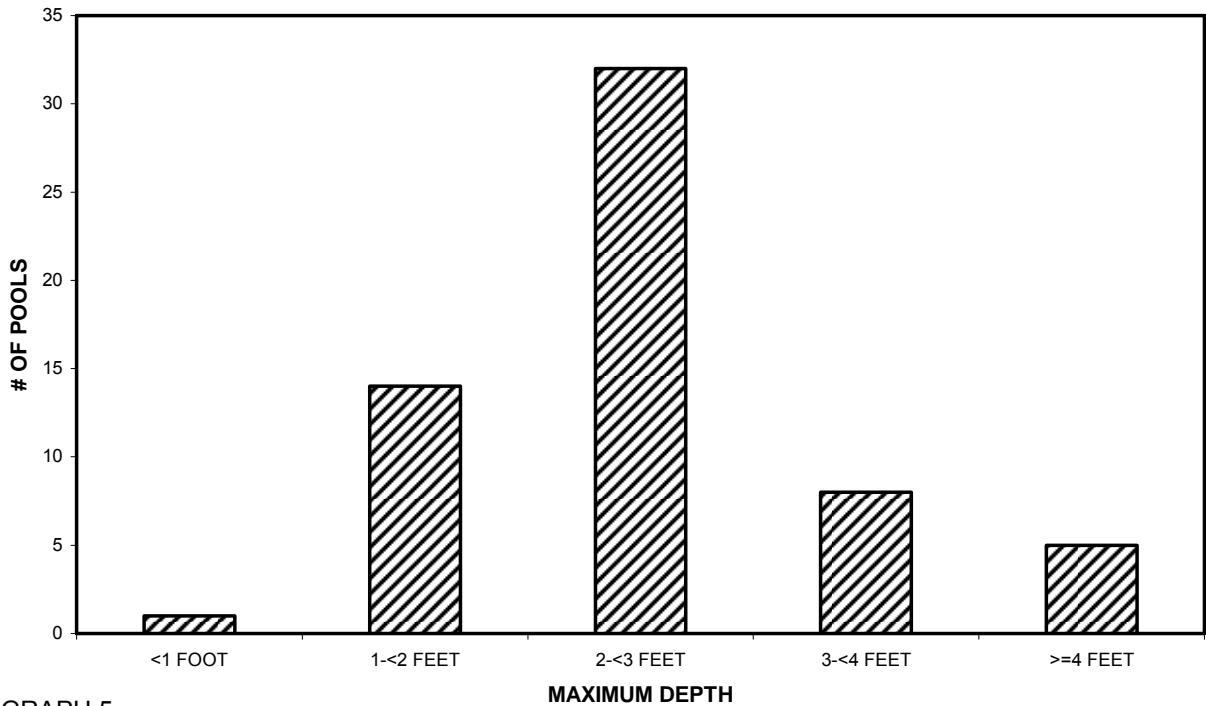
## LEVEL I POOL HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 4

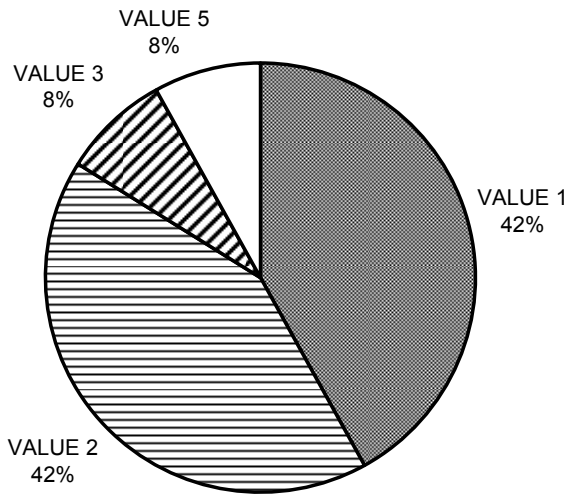
# KIDD CREEK

## MAXIMUM DEPTH IN POOLS



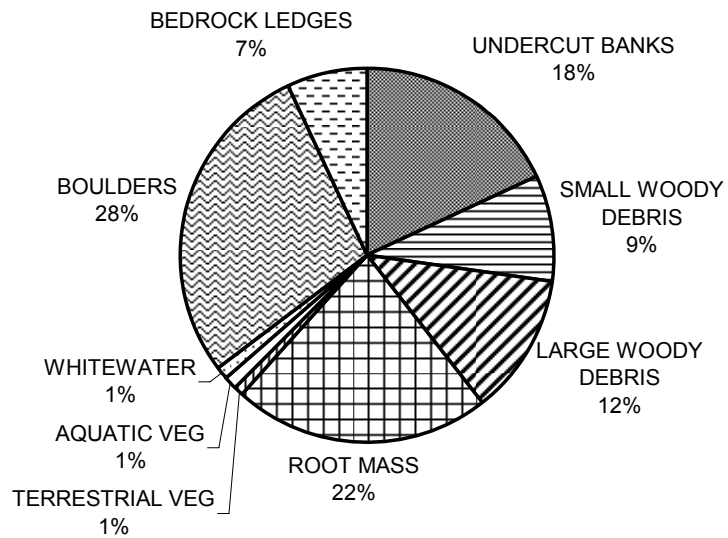
GRAPH 5

## KIDD CREEK PERCENT EMBEDDEDNESS



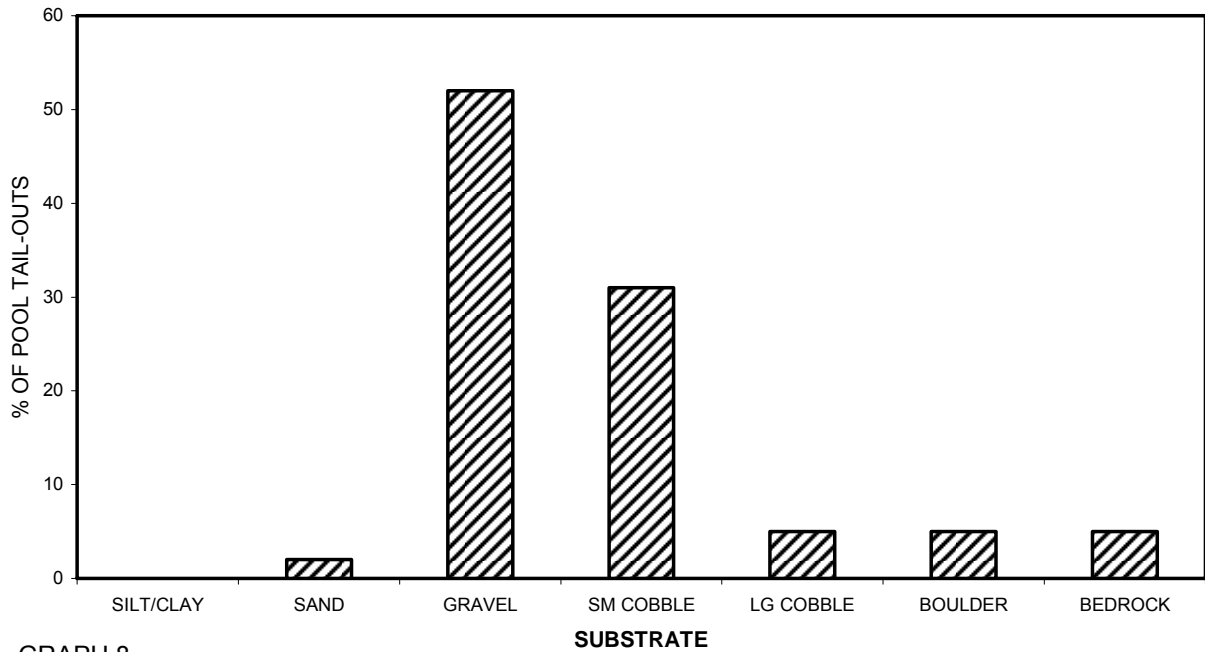
GRAPH 6

## KIDD CREEK MEAN PERCENT COVER TYPES IN POOLS



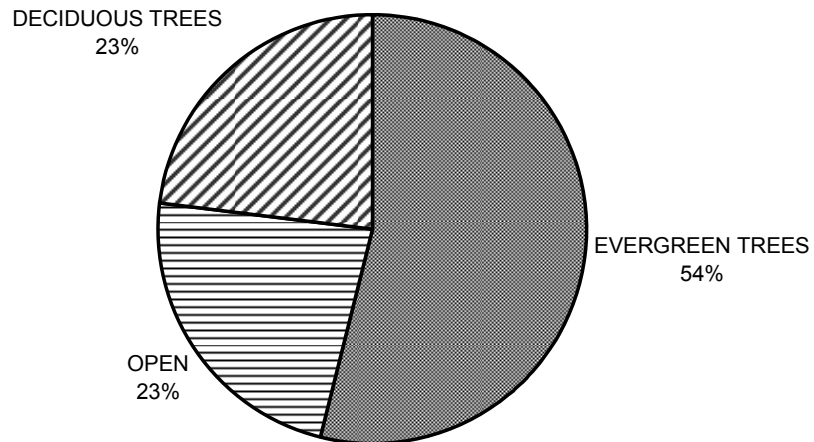
GRAPH 7

# KIDD CREEK SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



GRAPH 8

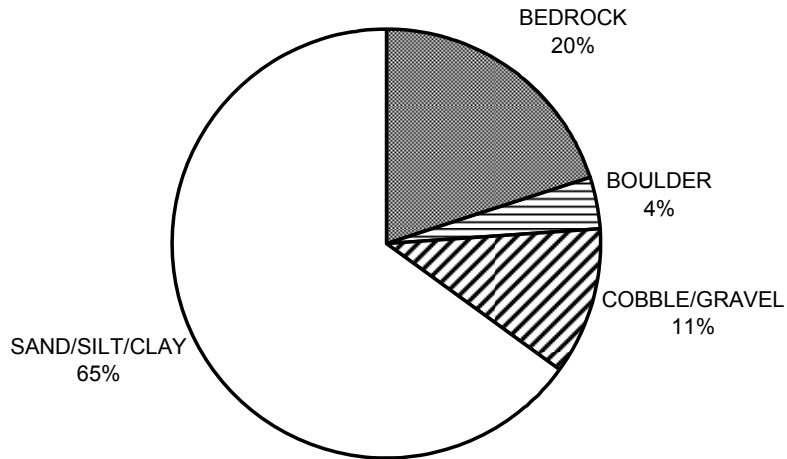
# KIDD CREEK MEAN PERCENT CANOPY



GRAPH 9

# KIDD CREEK

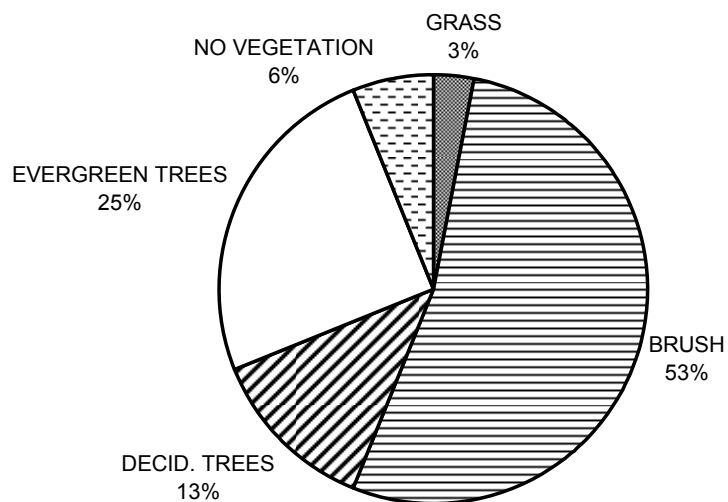
## DOMINANT BANK COMPOSITION IN SURVEY REACH



GRAPH 10

# KIDD CREEK

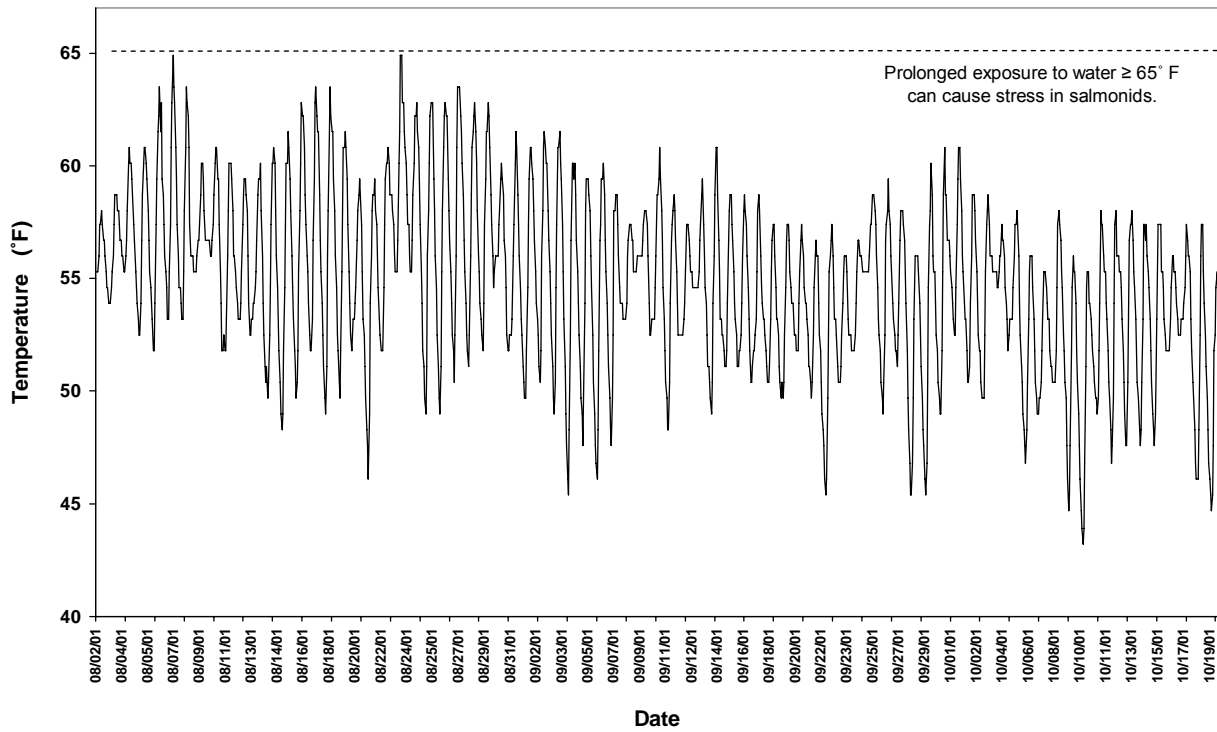
## DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11

APPENDIX E:

Kidd Creek Water Temperatures



Hydrologic Sub-Areas covered by the watershed:

**Tributary to** Austin Creek  
**Tributary to** Russian River  
**Tributary to**

**Name:** Kidd Creek      **LLId: (1:24k)** 1230682384956      **County:** Sonoma  
**Location:**      **T:** 08N      **R:** 11W      **S:** 34      **Latitude:** 38.4956959837786      **Longitude** 123.068256428874

Hydrologic Boundary Delineation: Watershed boundaries were delineated using the Watershed Point tool in ArcHydro, running under ArcMap 8.3 (ArcInfo version). A 1:24k stream network was "burned" into the underlying DEM to enforce hydrologic routing.

Aerial Photos (Source): For Mendocino County watersheds, 1993 USGS DOQQs are available in the Teale Albers, NAD27 projection. For Sonoma County watersheds, 2000 County-created orthophotos in the State Plane, NAD83 projection are also available.

<b>Stream Order:</b> <u>3</u>	<b>Total Length:</b> 2.78 Miles	Note: Length is for the USGS blue-line 1:24,000 stream.
Note: Stream order is by Strahler method, recorded in CDF-NCWAP "nhydro1" 1:24k streams layer.	4.48 Km	

<b>Drainage Area:</b>	792 Hectares
	1958 Acres
	3.05 sq. mi.

<b>Elevations:</b>	Mouth: <u>30</u> feet
	Headwaters: <u>2198</u> feet
	Note: Headwaters elevation is the highest elevation found in the watershed.

**Lakes in Watershed:** Number: 0      Surface area: 0 sq. mi.  
 Note: Source for lakes data is the USGS-DFG 1:100k lakes layer "lakes.shp"

**Fish Species (as indicated by historical salmonid streams layer created by Bob Coey):** Coho, Steelhead

**Ownership, for the watershed, in acres (and % of total watershed):**

Federal:	State:	Local:	Private:
0.0 acres	0.0	0.0	1957.8
0.00 %	0.00 %	0.00 %	100.00 %

Note: Source for ownership data is 2002 DFG-CCR "ccr\_public\_lands.shp" GIS layer.

**Major Land Uses in the Watershed, in acres (and % of total watershed)**

<b>Mixed hardwood/conifer:</b>	<b>Hardwood:</b>	<b>Conifer:</b>	<b>Agriculture:</b>	<b>Urban:</b>
970.19 acres	529.72	252.81	0.00	0.00
49.6 %	27.1 %	12.9 %	0.0 %	0.0 %
<b>Shrub:</b>	<b>Herbaceous:</b>	<b>Barren/rock:</b>	<b>Water:</b>	
0.00	196.75	0.00	5.86	
0.0 %	10.1 %	0.0 %	0.3 %	

Note: Land use areas were calculated using the 1994 CDF-USFS "Calveg" GIS layer.

## USGS 7.5' Topographic Quads completely or partially in the watershed:

Quad Name	USGS Code
DUNCAN MILLS	38123D1
CAZADERO	38123E1

## Endangered/Threatened/Sensitive Species: (California Natural Diversity Database, May 5, 2003 version )

Scientific Name	Common Name
Arborimus pomo	red tree vole
Syncaris pacifica	California freshwater shrimp

## Hydrologic Sub-Areas covered by the watershed

Hydrologic Sub-Area Name:	ID code (RBUAS)	Hydrologic Area Name	% of watershed in this HSA
Russian Gulch	111390	Russian Gulch	0.01
Guerneville	111411	Lower Russian River	99.74
Austin Creek	111412	Lower Russian River	0.25