Stream Inventory Report

Coleman Valley Creek

Salmon Creek Watershed
Sonoma County, California

Survey: Summer 2002
Final Report: September, 2004

California Department of Fish and Game
Central Coast Region
Watershed Restoration Program

2003

CALIFORNIA DEPARTMENT OF FISH AND GAME
STREAM INVENTORY REPORT
Coleman Valley Creek

INTRODUCTION

A stream inventory was conducted from 6/29/2002 – 9/22/2002 on Coleman Valley Creek, a tributary to Salmon Creek in the Salmon Creek watershed, southern Sonoma County. The survey began at the confluence with Salmon Creek and extended upstream 2.9 miles. The inventory was conducted in two parts: habitat inventory and biological inventory. The objective of the habitat inventory was to document the amount and condition of available habitat to fish, and other aquatic species with an emphasis on anadromous salmonids in Coleman Valley Creek. The objective of the biological inventory was to document the salmonid and other aquatic species present and their distribution.

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

WATERSHED OVERVIEW

Coleman Valley Creek is located in Sonoma County, California and is a tributary to Salmon Creek. The legal description at the confluence with Salmon Creek is T6N, R10W, Section Bodega. Its location is 38.361°N latitude and 123.0167° longitude. Year round vehicle access exists from Salmon Creek Road via Bodega Highway near the town of Bodega.

Coleman Valley Creek and its tributaries drain a basin of approximately 2.86 square miles. Coleman Valley Creek is a maximum 2nd order stream and has approximately 5.8 miles of blue line or dashed blue line stream, according to the USGS Valley Ford 7.5 minute quadrangle. Coleman Valley Creek has one major tributary, named Green Creek that was not surveyed. Coleman Valley Creek also has four minor unnamed tributaries, which were not surveyed but their locations were noted. Elevations range from about 197’ at the mouth of the creek to 1133’ at the headwaters. Grasslands, mixed hardwood, and coniferous forests dominate the watershed. The watershed is primarily privately owned and is managed for rangeland and recreation. Development is rural residential.

Salmonid fish species historically present include coho salmon*(Oncorhynchus kisutch)* and steelhead trout*(Oncorhynchus mykiss.* Salmonid fish species currently present include steelhead trout*(Oncorhynchus mykiss)* which is listed as threatened on the federal endangered species list.

METHODS

The habitat inventory conducted in Coleman Valley Creek follows the methodology presented in the California Salmonid Stream Habitat Restoration Manual (Flosi, et al., 1998). The California Department of Fish and Game (DFG) field crew that conducted the inventory was trained in standardized habitat inventory methods by DFG. This inventory was conducted by 2 person teams and was supervised by DFG's North Bay Restoration Planner, Gail Seymour.

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 Coleman Valley Creek to record measurements and observations. There are nine components to the inventory form: flow, channel type, temperatures, habitat type, embeddedness, shelter rating, substrate composition, canopy, and bank composition.

1. Flow:

Flow is measured in cubic feet per second (cfs) at the bottom of the stream survey reach using standard flow measuring equipment, if available. In some cases flows are estimated. Flows were also measured or estimated at major tributary confluences.

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:

Water and air temperatures, and time, are measured by crew members with hand held thermometers and recorded at each tenth unit typed. Temperatures are measured in 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 (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. Coleman Valley 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 were in feet to the nearest tenth. All measurements are in feet to the nearest tenth. Habitat characteristics are measured using a hip chain, and stadia rod.

5. Embeddedness:

The depth of embeddedness of the cobbles in pool tail-out reaches is measured by the percent of the cobble that is surrounded or buried by fine sediment. In Coleman Valley Creek, embeddedness was ocularly estimated. The values were recorded using the following ranges: 0 - 25% (value 1), 26 - 50% (value 2), 51 - 75% (value 3), 76 - 100% (value 4). Additionally, a rating of "not suitable" (value 5) was assigned to tail-outs deemed unsuited for spawning due to inappropriate substrate particle size, having a bedrock tail-out, 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. Using an overhead view, a quantitative estimate of the percentage of the habitat unit covered is made. All shelter is then classified according to a list of nine shelter types. In Coleman Valley Creek, a standard qualitative shelter value of 0 (none), 1 (low), 2 (medium), or 3 (high) was assigned according to the complexity of the shelter. The shelter rating is calculated for each habitat unit by multiplying shelter value and percent covered. 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 measured habitat units, dominant and sub-dominant substrate elements were ocularly estimated using a list of seven size classes which are defined in the California Salmonid Stream Habitat Restoration Manual.

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. In Coleman Valley Creek, an estimate of the percentage of the habitat unit covered by canopy was made from the top 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 Coleman Valley Creek, the dominant composition type and the dominant vegetation type of both the right and left banks for each fully measured 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 stream inventory is used to determine fish species and their distribution in the stream. Biological inventory is conducted using one or more of four basic methods: 1) stream bank observation, 2) underwater observation, 3) electro fishing, or 4) seine netting. Methods 1-3 are discussed in the California Salmonid Stream Habitat Restoration Manual. Seine netting is a fish capture technique that involves the use of a one meter square net attached to dowels on two parallel sides. The surveyor pushes the seine through the habitat unit to catch aquatic organisms. At the end of the unit the surveyor scoops up the seine and places all captured organisms in a bucket partially filled with stream water for holding. The water is aerated with a bubbler to maintain dissolved oxygen levels and minimize stress on the organisms. All fish, amphibians, and reptiles in the holding bucket are identified to species, counted and returned to the steam. Data is recorded on an electrofishing field form. Seine netting is used to confirm the presence of a species, particularly salmon and steelhead, and is not intended to quantify a population estimate.

IMPACT INVENTORY & ANALYSIS

Problems such as migration barriers, streambed erosion, poor water quality or temperatures are noted in the comments and landmarks section. In some cases measurements are taken, an analysis of what caused the problem is made and restoration potential and alternatives are recommended.

DATA ANALYSIS

Data from the habitat inventory form are entered into Habitat for data storage and analysis. Habitat is a Visual Basic extension to Microsoft Access, developed by Zebulon Young, University of California, Berkeley. This program processes and summarizes the data, and produces the following tables and appendices:

- Summary of riffle, flatwater, and pool habitat types
- Summary of habitat types and measured parameters
- Summary of pool types
- Summary of maximum pool depths by pool habitat types
- Summary of shelter by habitat types
- Summary of dominant substrates by habitat types
- Summary of fish habitat elements by stream reach

Graphics are produced from the tables using Microsoft Excel.

Graphics developed for Coleman Valley Creek include:

- Level II habitat types by % occurrence
- Level II habitat types by % total length
- Level IV habitat types by % occurrence
- Level I pool habitat types by % occurrence
- Maximum depth in pools
- Percent embeddedness estimated in pool tail-outs
- Mean percent cover types in pools
- Substrate composition in pool tail-outs
- Mean percent canopy
- Dominant bank composition in survey reach
- Dominant bank vegetation in survey reach

HISTORICAL STREAM SURVEYS:

The Department of Fish and Game has not conducted previous stream habitat surveys of Coleman Valley Creek.

HABITAT INVENTORY RESULTS FOR COLEMAN VALLEY CREEK

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

The habitat inventory of Coleman Valley Creek, 6/29/2002 - 9/22/2002, was conducted by D. Mitchel, R. Alexander, L. Earthman, and G. Seymour with supervision and analysis by the California Department of Fish and Game (DFG). The survey began at the confluence with Salmon Creek and extended up Coleman Valley Creek to the end of anadromous fish passage at rock falls. The total length of stream surveyed was 15,370 feet, with an additional 358 feet of side channel.

Flows were not measured on Coleman Valley Creek. Very little flow was observed throughout the creek during this low rainfall year.

The surveyed section of Coleman Valley Creek has three reaches with three distinct channel types: from the mouth to 10,052 feet an **F4**, 10,052 feet to 13,527 (3,475 feet) a **B3** and 13,527 feet to 15,370 feet (1,843 feet) an **A2**.

F4 channel types are entrenched meandering riffle/pool channels on low gradients (<2%) with a high width/depth ratio and a predominantly gravel substrate.

B3 channel types are moderately entrenched, moderate gradient (2-4%), riffle dominated channels, with infrequently spaced pools, a very stable plan and profile, stable banks and have a

predominantly cobble substrate.

A2 channel types are steep (4-10%), narrow, cascading, step-pool streams with a high energy/debris transport associated with depositional soils and a predominantly boulder substrate.

Water temperatures on the survey days ranged from 50°F to 68°F. Air temperatures ranged from 50°F to 79°F.

Table 1 summarizes the Level II riffle, flatwater, and pool habitat types. Based on frequency of ***occurrence*** there were 49.3% Flatwater units, 31.4% Pool units, 11.8% Dry units and 7.4% Riffle units (Graph 1). Based on total ***length*** there were 48.2% Flatwater units, 26.5% Dry units, 21.6% Pool units and 3.8% Riffle units (Graph 2).

Two-hundred and thirty habitat units were measured and 16% were completely sampled. Seventeen Level IV habitat types were identified. The data is summarized in Table 2. The most frequent habitat types by percent ***occurrence*** were Glide at 21%, Run at 17%, Dry at 12%, Lateral Scour Pool - Root Wad Enhanced at 11%, Step Run at 11%, Mid-Channel Pool at 11%, Low Gradient Riffle at 4%, Lateral Scour Pool - Boulder Formed at 3%, Step Pool at 2%, Cascade at 2%, Lateral Scour Pool - Log Enhanced at 2%, Bedrock Sheet at 1%, Lateral Scour Pool - Bedrock Formed at 1%, Backwater Pool - Root Wad Formed at 1%, and Not Surveyed at 1% (Graph 3). By percent total ***length***, Dry at 26%, Glide at 22%, Run at 15%, Step Run at 11%, Lateral Scour Pool - Root Wad Enhanced at 8%, Mid-Channel Pool at 6%, Low Gradient Riffle at 3%, Step Pool at 2%, Lateral Scour Pool - Log Enhanced at 2%, Lateral Scour Pool - Boulder Formed at 2%, Lateral Scour Pool - Bedrock Formed at 1%, Bedrock Sheet at 1%, and Corner Pool at 1%.

Seventy-two pools were identified (Table 3). Lateral Scour Pool - Root Wad Enhanced pools were most often encountered at 11% of all habitat types (Table 2), and comprised 56% of the total length of pools.

Table 4 is a summary of maximum pool depths by pool habitat types. Pool quality for salmonids increases with depth. Fifty three of the 68 pools (78%) had a depth of two feet or greater (Graph 5). These deeper pools comprised 16% of the total length of stream habitat.

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. Pools rated 14 and Flatwater units rated 14 (Table 1). Of the pool types, Corner Pool rated 20, Lateral

Scour Pool - Boulder Formed rated 19, Lateral Scour Pool - Log Enhanced rated 18, Lateral Scour Pool - Bedrock Formed rated 8, Step Pool rated 14, Lateral Scour Pool - Root Wad Enhanced rated 14, Mid-Channel Pool rated 10 and Backwater Pool - Root Wad Formed rated 5 (Table 2).

Table 5 summarizes fish shelter by habitat type. By percent area, the dominant pool shelter types were Boulders at 35%, Root Mass at 31%, Small Wood at 11%, Terrestrial Vegetation at 8%, Large Wood at 4%, White Water at 4%, Undercut Banks at 4%, and Bedrock at 3%. Graph 7 describes the pool shelter in Coleman Valley Creek.

Table 6 summarizes the dominant substrate by habitat type. In 4 of the 10 Low-Gradient Riffles surveyed, the dominant substrate was: Small Cobble in three riffles and Sand in one riffle (Graph 8).

No mechanical gravel sampling was conducted in 2002 surveys due to inadequate staffing levels.

The depth of cobble embeddedness was estimated at pool tail-outs. Of the 54 pool tail-outs measured, 4 had a value of 1 (13%), 33 had a value of 2 (55%), 11 had a value of 3 (19%) and 1 had a value of 4 (3%). 5 (10%) riffles rated a 5 (unsuitable substrate type for spawning). On this scale, a value of one is best for fisheries. Gravel was the dominant substrate observed at pool tail-outs (Graph 8). Table 9 describes percent embeddedness by reach.

The mean percent canopy density for the stream reach surveyed was 65%. The mean percentages of deciduous and evergreen trees were 72% and 20%, respectively. Graph 9 describes the canopy for the entire survey and Table 9 describes the canopy by reach.

For the entire stream reach surveyed, the mean percent right bank vegetated was 20% and the mean percent left bank vegetated was 18%. For the habitat units measured, the dominant vegetation types for the stream banks were: 45% Deciduous Trees, 16% Grass, 14% Bare Soil, 13% Brush and 9% Evergreen Trees (Graph 11). The dominant substrate for the stream banks were: 33% Silt, Clay & Sand, 31% Cobble & Gravel, 25% Boulder and 10% Bedrock (Graph 10).

BIOLOGICAL INVENTORY

JUVENILE SURVEYS:

Department of Fish and Game has conducted previous biological inventories of Coleman Valley Creek and there are no records of hatchery releases or fish rescues in the Salmon Creek watershed. A biological inventory was not conducted in 2002, although during the stream habitat inventory, surveyors observed many juvenile steelhead as well as stickleback, roach, and sculpin. Other species observed during the stream habitat survey included rough-skinned newts, frogs, snakes, and Pacific giant salamanders.

Historic Biological Surveys Summaries

In September, 2001, DFG staff, Morgan Knechtle and crew conducted a biological survey in a lower and middle reach of Coleman Valley Creek. The focus was to determine coho salmon presence/absence. The creek was split into three reaches and ten pools per reach were electrofished using DFG's "10 Pool" Protocol. The upper reach was not surveyed due to lack of water.

Species Observed in Historical and Recent Surveys

YEARS	SPECIES	SOURCE	NATIVE/ INTRODUCED
2001	STEELHEAD TROUT *(Oncorhynchus mykiss)*	DFG	N
2001	SCULPIN OR COTTOIDS *(Cottus sp.)*	DFG	N
2001	CALIFORNIA ROACH *(Hesperoleucus symmetricus)*	DFG	N
2001	THREESPINE STICKLEBACK (Gasterosteus aculeatus williamsoni)	DFG	N

DISCUSSION FOR COLEMAN VALLEY CREEK

Coleman Valley Creek as 3 reaches: from the mouth to 10,052 feet an **F4**, 10,052 feet to 13,527 (3,475 feet) a **B3** and 13,527 feet to 15,370 feet (1,843 feet) an **A2**.

There are 10,052 feet of **F4** channel type in Reach 1. According to the DFG Salmonid Stream Habitat Restoration Manual,

F4 channel types are good for bank-placed boulders and fair for low-stage weirs, single and opposing wing-deflectors, channel constrictors and log cover. Many site specific projects can be designed within this channel type, especially to increase pool frequency, volume and shelter. Any work considered will require careful design, placement, and construction that must include protection for any unstable banks.

There are 3,475 feet of **B3** channel type in Reach 2. According to the DFG Salmonid Stream Habitat Restoration Manual, B3 channel types are excellent for low-stage plunge weirs, boulder clusters, bank placed boulders, single and opposing wing-deflectors and log cover. They are also good for medium-stage plunge weirs. Many site specific projects can be designed within this channel type, especially to increase pool frequency, volume and shelter. These channel types have suitable gradients and the stable stream banks that are necessary for the installation of instream structures designed to increase pool habitat, trap spawning gravels, and provide protective shelter for fish.

There are 1,843 feet of **A2** channel type in Reach 3. According to the DFG Salmonid Stream Habitat Restoration Manual, the high energy, steep gradient A2 channel types have stable stream banks and poor gravel retention capabilities and are generally not suitable for instream enhancement structures.

The water temperatures recorded on the survey days, 6/29/2002 - 9/22/2002, ranged from 50°F to 68°F. Air temperatures ranged from 50°F to 79°F. The warmest water temperatures were recorded in Reach 1.

Water temperatures exceeded the threshold stress level (65°F) for salmonids on only two occasions (66°F and 68°F) in Reach 1. Overall, the water temperature regime in Coleman Valley Creek is favorable to salmonids. It is unknown if this thermal regime is typical. To make any further conclusions, temperatures need to be monitored for a longer period of time through the critical summer months, and\or more extensive biological sampling conducted.

Pools comprised 22% of the total length of this survey. In first and second order streams a primary pool is defined to have a maximum depth of at least two feet, occupy at least half the width of the low flow channel, and be as long as the low flow channel width. In Coleman Valley Creek, the pools are relatively deep with 74% having a maximum depth of at least two feet. These pools comprised 16% of the total length of stream habitat, however, in coastal coho and steelhead streams, it is generally desirable to have primary pools comprise approximately 50% of

total habitat length.

The mean shelter rating for pools was 14. A pool shelter rating of approximately 80 is desirable. The relatively small amount of pool shelter that now exists is being provided primarily by Boulders at 35%, Root Mass at 31%, Small Wood at 11%, Terrestrial Vegetation at 8%, Large Wood at 4%, White Water at 4%, Undercut Banks at 4% and Bedrock at 3%. Log and rootwad cover in the pool and flatwater habitats would improve both summer and winter salmonid habitat. Log cover provides rearing fry with protection from predation, rest from water velocity, and also divides territorial units to reduce density related competition.

3 of the 4 low gradient riffles measured (75%) had either gravel or small cobble as the dominant substrate. This is generally considered good for spawning salmonids.

Seventeen percent of the pool tail-outs measured had embeddedness ratings of either 3 or 4. Only 6% had a rating of 1. Cobble embeddedness measured to be 25% or less (a rating of 1) is considered best for the needs of salmon and steelhead. In a reach comparison, Reach 2 had the best rating and Reach 3 had the poorest rating.

The higher the percent of fine sediment, the lower the probability that eggs will survive to hatch. This is due to the reduced quantity of oxygenated water able to percolate through the gravel, or because of fine sediment capping the redd and preventing fry emergence. In Coleman Valley Creek, sediment sources in all three reaches should be mapped and rated according to their potential sediment yields, and control measures taken.

The mean percent canopy for the survey was 65%. This is fair since 80 percent is generally considered desirable. However, Reach 1 had a canopy of 59% with areas of bank erosion problems. Although water temperatures in Coleman Valley Creek are favorable to salmonids, increased canopy would eliminate hotspots that were observed in some reaches. Planting large trees required for adequate stream canopy would also eventually provide a long term source of large woody debris needed for instream shelter and bank stability. Reach 1 as well as other areas with bank erosion could benefit from bio-technical re-vegetation techniques using native species.

GENERAL MANAGEMENT RECOMMENDATIONS

Coleman Valley 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. Signs of recent and historic tree and log removal were evident in the active channel during our survey. Efforts to increase flood protection or improve fish access in the short run, have led to long term problems in the system. 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.

PRIORITY FISHERY ENHANCEMENT OPPORTUNITIES

1) Rearing conditions throughout the creek appear inadequate at this time due to low flow. Pools were disconnected due to lack of flow. Low instream flow should be addressed by increasing riparian protection and restoration, sediment control, and employing best management practices that encourage permeability and infiltration.

2) There is at least 1 section (Reach 1) where the stream is being impacted from livestock in the riparian zone. Livestock in streams generally inhibit the growth of new trees, exacerbate erosion, and reduce summertime survival of juvenile fish by defecating in the water. Alternatives to limit cattle access, control erosion and increase canopy should be explored with the landowner, and developed if possible.

3) Map sources of upslope and in-channel 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. Near-stream riparian planting along any portion of the stream should be encouraged to provide bank stability and a buffering against agricultural, grazing and urban runoff.

4) In Coleman Valley Creek, active and potential sediment sources related to the road system need to be mapped and treated according to their potential for sediment yield to the stream and its tributaries.

5) Increase the canopy on Coleman Valley Creek by planting willow, alder, redwood, and Douglas fir along the stream where shade canopy is not at acceptable levels (portions of Reaches 1 and 2). The non-anadromous reach above the survey section

should be assessed for planting and treated as well, since water temperatures throughout are affected from upstream. In many cases, planting will need to be coordinated to follow bank stabilization or upslope erosion control projects.

6) Reach 1 would benefit from the utilization of bio-technical vegetative techniques to re-establish floodplain benches and a defined low flow channel. This would discourage lateral migration of the base flow channel and decrease bank erosion.

7) Where feasible, increase woody cover in the pool and flatwater habitat units along the entire stream. Most of the existing shelter is from boulders and rootmass. Adding high quality complexity with larger woody cover is desirable. Combination cover/scour structures constructed with boulders and woody debris would be effective in many flatwater and pool locations throughout the stream. This must be done where the banks are stable (Reach 2) or in conjunction with stream bank armor to prevent erosion (Reach 1). In some areas the material is at hand.

8) Conduct gravel sampling. Results of future sampling may indicate the need for structures to decrease channel incision, recruit and trap spawning gravel and expand redd distribution in the stream.

9) Where feasible, design and engineer pool enhancement structures to increase the number of pools in Reaches 1 and 2. This must be done where the banks are stable (Reach 2) or in conjunction with stream bank armor to prevent erosion (Reach 1).

COMMENTS AND LANDMARKS

The following landmarks and possible problem sites were noted. All locations (footage) are approximate and taken from the beginning of the survey.

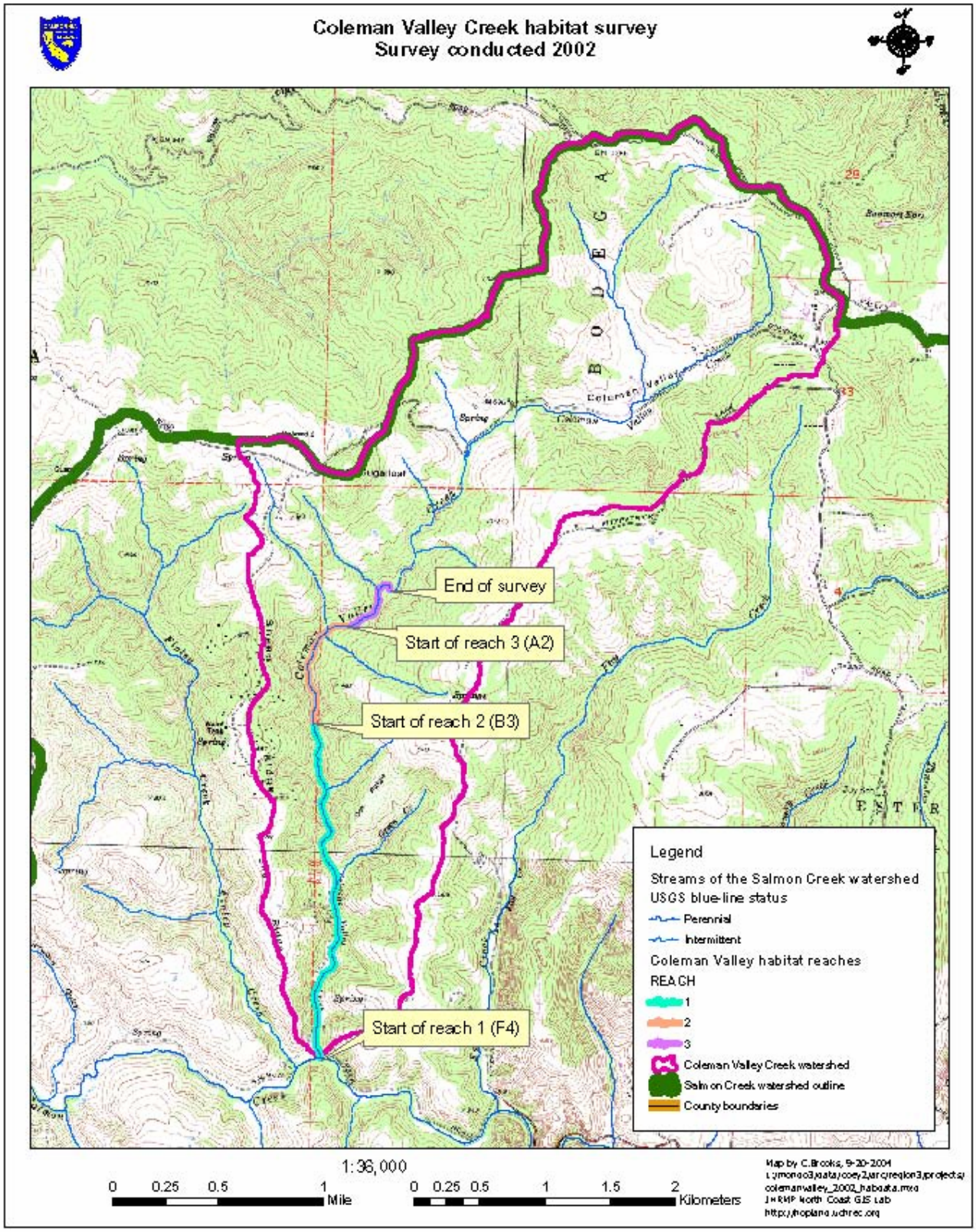
Location (feet)	Notes
58	First 11' dry; gravel bar w/ livestock access; erosion on right bank.
96	Fifteen young-of-the-year (YOY) steelhead/rainbow trout (SH/RT).
154	Five 1 year or older (1+) age class SH/RT; significant amount of Small woody Debris (SWD).
241	Erosion on right bank.
273	7 1+ SH/RT.
339	Shotgun culvert 18" diameter, 8' out from bank, 3' above creek, at 56' into unit.
412	40 YOY SH/RT.
652	5 1+ SH/RT; 100 YOY SH/RT.

Location (feet)	Notes
739	100 YOY SH/RT; Erosion on Left bank.
888	1.3' rootrwad enhanced pool w/ 50 YOY SH/RT.
1148	BRIDGE; Small pool 1.8' deep, lateral scour at bridge abuttment; deposition on left bank.
1273	4 1+ SH/RT; channel typed at this unit (F4)
1566	Channel appears to be drying up. First sighting of willows; 2 small pools, 1.6' deep; Shotgun culvert 18" diameter
1619	Dense alder canopy.
1916	Riprap for road protection; dense alder canopy.
2070	3 1+ SH/RT (3" long), 100 YOY SH/RT; shotgun culvert .
2418	5 1+ SH/RT.
2552	Dense alder grove.
3446 to 3928	livestock access throughout reach.
3928	12 YOY SH/RT; 1 1+ SH/RT.
4076	Erosion left bank 120'; fir, bay and alder increasing
4133	Cattle fencing falling over.
4700	livestock access;algae bloom
5006	Entire length of lower Coleman Valley Creek fenced on left bank; road on right bank. livestock have access to creek.
5331	Straight stretch of creek.
5654	DRY; two large redwoods 100' tall.
6240	200 YOY SH/RT
6994	Glide interspersed w/ 1.5' pools boulder enhanced
7058	20 YOY
7257	Old logging road on right bank
7292	25 YOY
7921	DRY; fence across creek at 158' into unit
8190	25 YOY
8579	2 boulder formed pools < 1' deep; spring fed; 50 YOY
9527	unnamed dry trib, right bank, 189' into unit
10472	DRY; CHANNEL CHANGE FROM F4 TO B3
11864	7 YOY SH/RT
12203	A lot of macro invertebrates; 25 YOY SH/RT
12258	YOY SH/RT; boulder formed pool; 20' doug fir and redwood lying over step pool
12334	Redwood log over channel; 6 YOY SH/RT, 1 1+ SH/RT; pool drying up
12358	Small puddles of water but mostly dry
12420	Macroinvertebrates; 10 YOY SH/RT, possibly spring fed area; gully or dry tributary on right bank.
12477	Large Woody Debris (LWD) and SWD.
12525	Some right bank erosion
12706	10 YOY SH/RT
12737	1 1+ SH/RT, 12 YOY SH/RT
12884	Erosion on right bank 75'L x 30'h x15' deep contributing fines.
13028	4 YOY SH/RT
13175	20 1+ SH/RT

Location (feet)	Notes
13309	A lot of macro invertebrates; plunge pool; 12 YOY SH/RT; light erosion on left bank; waterfall aprox 18' above stream level -- possibly a partial barrier
13337	10' vertical jump to small 8' bedrock glide w/ 12 percent slope
13432	DRY
13476	Tiny puddles of water trapped in bedrock depressions
13495	YOY SH/RT present
13607	Macroinvertebrates and stickleback observed; Channel Change from B3 to A2
13692	Dry trib on left bank
13929	1+ SH/RT, Large Debris Accumulation
14023	12 stickleback; dry tributary on left bank at 58' into unit
14917	2 YOY SH/RT
14966	right bank wet trib w/ temp of 54 degrees F
15080	3 YOY SH/RT; a/aa+ channel; steep entrenched boulders and bedrock; deep entrenched bedrock pool w/ cool water temp. Very few fish; 5"-10" possible barrier throughout reach.
15154	2 YOY SH/RT
15297	Most of canopy is produced by cavernous bedrock
15336	1 YOY SH/RT; 3.5 ft jump near end of unit; possible partial fish barrier and step pool
15370	END OF SURVEY; Above possible barrier and below another possible anadromous barrier.

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.


Coleman Valley Creek habitat survey
Survey conducted 2002
End of survey
Start of reach 3 (A2)
Start of reach 2 (B3)
Start of reach 1 (F4)
Legend
Streams of the Salmon Creek watershed
USGS blue-line status
Perennial
Intermittent
Coleman Valley habitat reaches
REACH
1
2
3
Coleman Valley Creek watershed
Salmon Creek watershed outline
County boundaries
1:36,000
0 0.25 0.5 1 Mile
0 0.25 0.5 1 1.5 2 Kilometers
Map by C.Brooks, 9-20-2004
L:\mono03\data\coey2\arcgregion3\projects\colemanvalley_2002_habdata.mxd
NRMP North Coast GIS Lab
http://nopland.ucdrec.org

LEVEL III and LEVEL IV HABITAT TYPE KEY:

HABITAT TYPE	LETTER	NUMBER
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

Coleman Valley Creek — Drainage: Salmon Creek

Table 1 - SUMMARY OF RIFFLE, FLATWATER, AND POOL HABITAT TYPES — Survey Dates: 06/29/02 to 09/22/02

Confluence Location: QUAD: Valley Ford LEGAL DESCRIPTION: 1230154383611 LATITUDE: 38.36095′ LONGITUDE: 123.01547′

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 VOLUME (cu.ft.)	ESTIMATED TOTAL VOLUME (cu.ft.)	MEAN RESIDUAL POOL VOL (cu.ft.)	MEAN SHELTER RATING
17	4	RIFFLE	7	35	597	4	2.9	0.2	72	1222	13	216	0	0
113	11	FLATWATER	49	67	7571	48	7.0	0.5	295	33283	167	18911	0	9
72	20	POOL	31	47	3388	22	10.4	1.2	456	32837	538	38738	440	***
27	0	DRY	12	154	4163	26	0.0	0.0	0	0	0	0	0	0
1	1	NOT SURVEYED	0	9	9	0	1.0	0.1	1	1	0	0	0	0

TOTAL UNITS	TOTAL UNITS	TOTAL LENGTH (ft.)	TOTAL AREA (sq. ft.)	TOTAL VOL. (cu. ft.)
230	36	15728	67343	57866

Coleman Valley Creek — Drainage: Salmon Creek

Table 2 - SUMMARY OF HABITAT TYPES AND MEASURED PARAMETERS — Survey Dates: 06/29/02 to 09/22/02

Confluence Location: QUAD: Valley Ford LEGAL DESCRIPTION: 1230154383611 LATITUDE: 38.36095′ LONGITUDE: 123.01547′

HABITAT UNITS #	UNITS FULLY MEASURED	HABITAT TYPE	HABITAT OCCURRENCE %	MEAN LENGTH ft.	TOTAL LENGTH ft.	TOTAL LENGTH %	MEAN WIDTH ft.	MEAN DEPTH ft.	MAXIMUM DEPTH ft.	MEAN AREA sq.ft.	TOTAL AREA EST. sq.ft.	MEAN VOLUME cu.ft.	TOTAL VOLUME EST. cu.ft.	MEAN RESIDUAL POOL VOL cu.ft.	MEAN SHELTER RATING	MEAN CANOPY %
10	2	LGR	4	44	440	3	3	0.2	0.7	82	825	7	65	0	0	58
4	1	CAS	2	16	63	0	3	0.2	0.5	30	120	4	15	0	0	65
3	1	BRS	1	31	94	1	3	0.3	1.0	87	262	34	102	0	0	69
49	5	GLD	21	70	3451	22	8	0.6	1.7	402	19707	252	12346	0	8	75
38	1	RUN	17	63	2382	15	8	0.3	0.8	99	3767	21	792	0	0	53
26	5	SRN	11	67	1738	11	5	0.5	1.4	242	6286	121	3157	0	11	75
1	1	TRP	0	21	21	0	5	0.6	1.7	100	100	60	60	50	0	51
25	4	MCP	11	39	980	6	11	1.4	439.0	428	10706	591	14785	488	10	59
5	2	STP	2	75	374	2	12	1.0	3.2	523	2616	488	2440	316	14	67
1	1	CRP	0	25	25	0	9	1.0	2.5	225	225	225	225	203	20	94
4	1	LSL	2	80	320	2	12	1.2	3.3	523	2094	660	2638	681	18	88
26	7	LSR	11	47	1224	8	10	1.0	4.1	489	12720	512	13317	412	***	66
2	0	LSBk	1	65	130	1	11	1.3	3.8	679	1357	861	1722	626	8	35
7	4	LSBo	3	42	292	2	11	1.1	2.8	416	2909	486	3399	432	19	69
1	0	BPR	0	23	23	0	9	2.0	3.9	207	207	414	414	352	5	0
27	0	DRY	12	154	4163	26	0	0.0	0.0	0	0	0	0	0	0	63
1	1	NS	0	9	9	0	1	0.1	0.2	1	1	0	0	0	0	93

TOTAL UNITS	TOTAL UNITS	LENGTH (ft.)	AREA (sq.ft)	TOTAL VOL. (cu.ft)
230	36	15728	63900	55479

Coleman Valley Creek — Drainage: Salmon Creek

Table 3 - SUMMARY OF POOL TYPES — Survey Dates: 06/29/02 to 09/22/02

Confluence Location: QUAD: Valley Ford LEGAL DESCRIPTION: 1230154383611 LATITUDE: 38.36095′ LONGITUDE: 123.01547′

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 EST. (sq.ft.)	MEAN VOLUME (cu.ft.)	TOTAL VOLUME EST. (cu.ft.)	MEAN RESIDUAL POOL VOL. (cu.ft.)	MEAN SHELTER RATING
31	7	MAIN	43	44	1375	41	10.6	1.3	426	13219	556	17246	446	11
40	13	SCOUR	56	50	1990	59	10.3	1.1	481	19255	530	21189	438	***
1	0	BACKWATER	1	23	23	1	9.0	2.0	207	207	414	414	352	5

TOTAL UNITS	TOTAL UNITS	TOTAL LENGTH (ft.)	TOTAL AREA (sq.ft.)	TOTAL VOL. (cu.ft.)
72	20	3388	32680	38849

Coleman Valley Creek — Drainage: Salmon Creek

Table 4 - SUMMARY OF MAXIMUM POOL DEPTHS BY POOL HABITAT TYPES — Survey Dates: 06/29/02 to 09/22/02

Confluence Location: QUAD: Valley Ford LEGAL DESCRIPTION: 1230154383611 LATITUDE: 38.36095′ LONGITUDE: 123.01547′

UNITS MAX DPTH 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	1	0	0	1	100	0	0	0	0	0	0
23	MCP	32	0	0	2	9	14	61	4	17	3	13
4	STP	6	0	0	0	0	3	75	1	25	0	0
1	CRP	1	0	0	0	0	1	100	0	0	0	0
3	LSL	4	0	0	1	33	1	33	1	33	0	0
26	LSR	36	0	0	10	38	13	50	2	8	1	4
2	LSBk	3	0	0	0	0	1	50	1	50	0	0
7	LSBo	10	0	0	1	14	6	86	0	0	0	0
1	BPR	1	0	0	0	0	0	0	1	100	0	0

TOTAL UNITS
68

Coleman Valley Creek — Drainage: Salmon Creek

Table 5 - Summary of Shelter by Habitat Type — Survey Dates: 06/29/02 to 09/22/02

Confluence Location: QUAD: Valley Ford LEGAL DESCRIPTION: 1230154383611 LATITUDE: 38.36095′ LONGITUDE: 123.01547′

UNITS MEASURED	UNITS SHELTER MEASURED	HABITAT TYPE	% TOTAL UNDERCUT BANKS	% TOTAL SWD	% TOTAL LWD	% TOTAL ROOT MASS	% TOTAL TERR. VEGETATION	% TOTAL AQUATIC VEGETATION	% TOTAL WHITE WATER	% TOTAL BOULDERS	% TOTAL BEDROCK LEDGES
10	2	LGR	0	0	0	0	0	0	0	0	0
4	1	CAS	0	0	0	0	0	0	0	0	0
3	1	BRS	0	0	0	0	0	0	0	0	0
49	5	GLD	10	17	0	64	1	1	0	8	0
38	1	RUN	0	0	0	0	0	0	0	0	0
26	5	SRN	0	0	0	0	0	0	0	100	0
1	1	TRP	0	0	0	0	0	0	0	0	0
25	21	MCP	4	6	5	17	24	1	0	33	10
5	5	STP	0	0	0	0	0	0	23	77	0
1	1	CRP	0	30	0	20	10	0	40	0	0
4	3	LSL	0	31	14	55	0	0	0	0	0
26	21	LSR	8	18	7	59	4	0	0	4	0
2	2	LSBk	5	0	0	52	5	0	0	19	19
7	7	LSBo	0	8	0	14	2	0	0	76	0
1	1	BPR	0	0	0	100	0	0	0	0	0
27	0	DRY	0	0	0	0	0	0	0	0	0
1	1	NS	0	0	0	0	0	0	0	0	0
ALL HABITAT TYPES 230	78		4	11	4	32	7	0	3	35	3
POOLS ONLY 72	62		4	11	4	31	8	0	4	35	3

Coleman Valley Creek — Drainage: Salmon Creek

Table 6 - SUMMARY OF DOMINANT SUBSTRATES BY HABITAT TYPE — Survey Dates: 06/29/02 to 09/22/02

Confluence Location: QUAD: Valley Ford LEGAL DESCRIPTION: 1230154383611 LATITUDE: 38.36095′ LONGITUDE: 123.01547′

TOTAL HABITAT UNITS	UNITS SUBSTRATE 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
10	4	LGR	0	25	0	75	0	0	0
4	1	CAS	0	0	0	0	100	0	0
3	2	BRS	0	0	0	0	0	0	100
49	12	GLD	0	58	33	8	0	0	0
38	6	RUN	0	33	33	0	0	33	0
26	8	SRN	0	13	0	13	0	75	0
1	1	TRP	0	0	0	0	0	0	100
25	6	MCP	17	33	17	0	0	17	17
5	2	STP	0	0	0	0	0	100	0
1	1	CRP	0	100	0	0	0	0	0
4	2	LSL	0	50	50	0	0	0	0
26	10	LSR	20	50	20	0	10	0	0
2	0	LSBk	0	0	0	0	0	0	0
7	4	LSBo	25	75	0	0	0	0	0
1	1	BPR	0	100	0	0	0	0	0
27	5	DRY	0	0	0	20	40	40	0
1	1	NS	0	0	0	100	0	0	0

Coleman Valley Creek (So. Sonoma County)

Table 7. Summary of Mean Percent Vegetative Cover for Entire Stream

Mean Percent Canopy	Mean Percent Evergreen	Mean Percent Deciduous	Mean Right bank % Cover	Mean Left Bank % Cover
66.13	30.34	72.12	19.91	17.50

Table 8. Coleman Valley Creek (So. Sonoma County)

Mean Percentage of Dominant Substrate

Dominant Class of Substrate	Number Units Right Bank	Number Units Left Bank	Percent Total Units
Bedrock	8	9	9.77
Boulder	25	18	24.71
Cobble/Gravel	28	27	31.61
Silt/clay	26	32	33.33

Mean Percentage of Dominant Vegetation

Dominant Class of Vegetation	Number Units Right Bank	Number Units Left Bank	Percent Total Units
Grass	14	14	16.37
Brush	13	10	13.45
Deciduous Trees	39	40	46.20
Evergreen Trees	8	7	8.77
No Vegetation	11	14	14.62

TABLE 9-FISH HABITAT INVENTORY DATA SUMMARY

STREAM NAME: Coleman Valley Creek (So. Sonoma)
SAMPLE 06/29/2002 to 09/22/2002
SURVEY LENGTH:
MAIN 15370 ft. SIDE CHANNEL: 357.7 ft.
LOCATION OF STREAM MOUTH:
USGS Quad Map: Bodega Head Latitude: 38.355'N
Legal Description: T06N R10W Bodega Longitude: 122.0154'W

SUMMARY OF FISH HABITAT ELEMENTS BY STREAM REACH

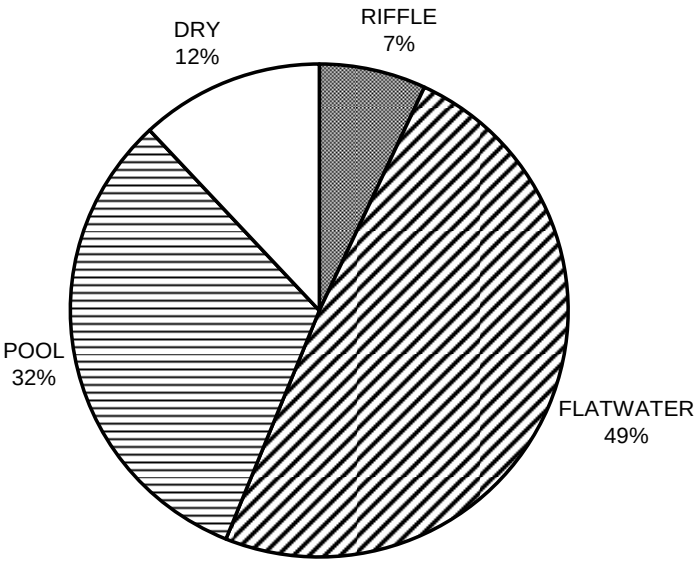
STREAM REACH 01 (Units 1-136)
Channel Type: F4 Mean Canopy Density: 59 %
Main Channel: 10052 ft. Evergreen: 13 %
Side Channel Length: 124 ft. Deciduous: 86 %
Riffle/Flatwater Mean Width: 8.6 ft. Pools by Stream: 30 %
Pool Mean Depth: 1.2 ft. Pools >=2 ft. Deep: 75 %
Base Flow: cfs Pools >=3 ft. Deep: 18 %
Water: 52-68°F Air: 59-73°F Mean Pool Shelter: 11
Dom. Bank No Vegetation Dom. Shelter: Root Masses
Bank Vegetative Cover: 22 % LOD Pool Shelter: 53 %
Dom. Bank Substrate: Silt/Clay/Sand Dry Channel: 2149 ft.
Embeddedness Value: 1. 3% 2. 74% 3. 19% 4. 3% 5. 0%

STREAM REACH 02 (Units 137-184)
Channel Type: B3 Mean Canopy Density: 70 %
Main Channel: 3475 ft. Evergreen: 41 %
Side Channel Length: 69 ft. Deciduous: 71 %
Riffle/Flatwater Mean Width: 5.0 ft. Pools by Stream: 25 %
Pool Mean Depth: 1.1 ft. Pools >=2 ft. Deep: 75 %
Base Flow: cfs Pools >=3 ft. Deep: 8 %
Water: 50-57°F Air: 50-79°F Mean Pool Shelter 18
Dom. Bank Veg.: Deciduous Trees Dom. Shelter: Boulders
Bank Vegetative Cover: 9 % LOD Pool Shelter: 6 %
Dom. Bank Substrate: Silt/Clay/Sand Dry Channel: 1929 ft.
Embeddedness Value: 1. 30% 2. 40% 3. 30% 4. 0% 5. 0%

STREAM REACH 03 (Units 185-223)
Channel Type: A2 Mean Canopy Density: 78 %
Main Channel: 1843 ft. Evergreen: 55 %
Side Channel Length: 165 ft. Deciduous: 46 %
Riffle/Flatwater Mean Width: 5.0 ft. Pools by Stream: 31 %
Pool Mean Depth: 1.3 ft. Pools >=2 ft. Deep: 71 %
Base Flow: cfs Pools >=3 ft. Deep: 29 %

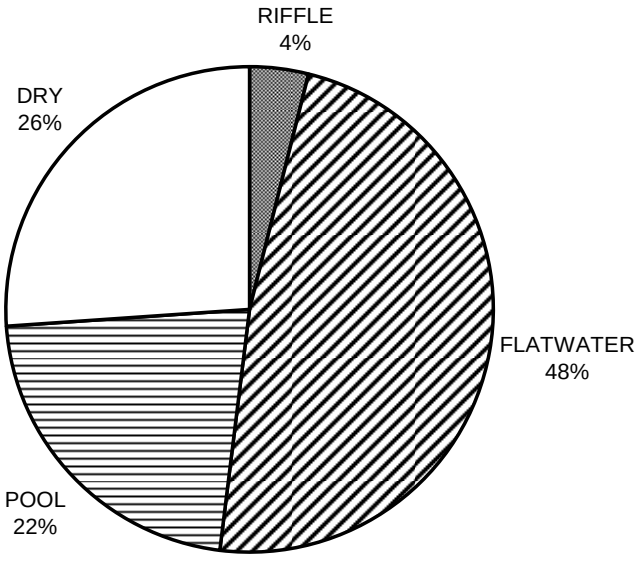
Water: 50-57°F Air: 54-70°F Mean Pool Shelter: 20
Dom. Bank Deciduous Trees Dom. Shelter: Boulders
Bank Vegetative Cover: 21 % LOD Pool Shelter: 16 %
Dom. Bank Substrate: Boulder Dry Channel: 29 ft.
Embeddedness Value: 1. 0 % 2. 46% 3. 15% 4. 0% 5. 38 %

COLEMAN VALLEY CREEK
HABITAT TYPES BY PERCENT OCCURRENCE



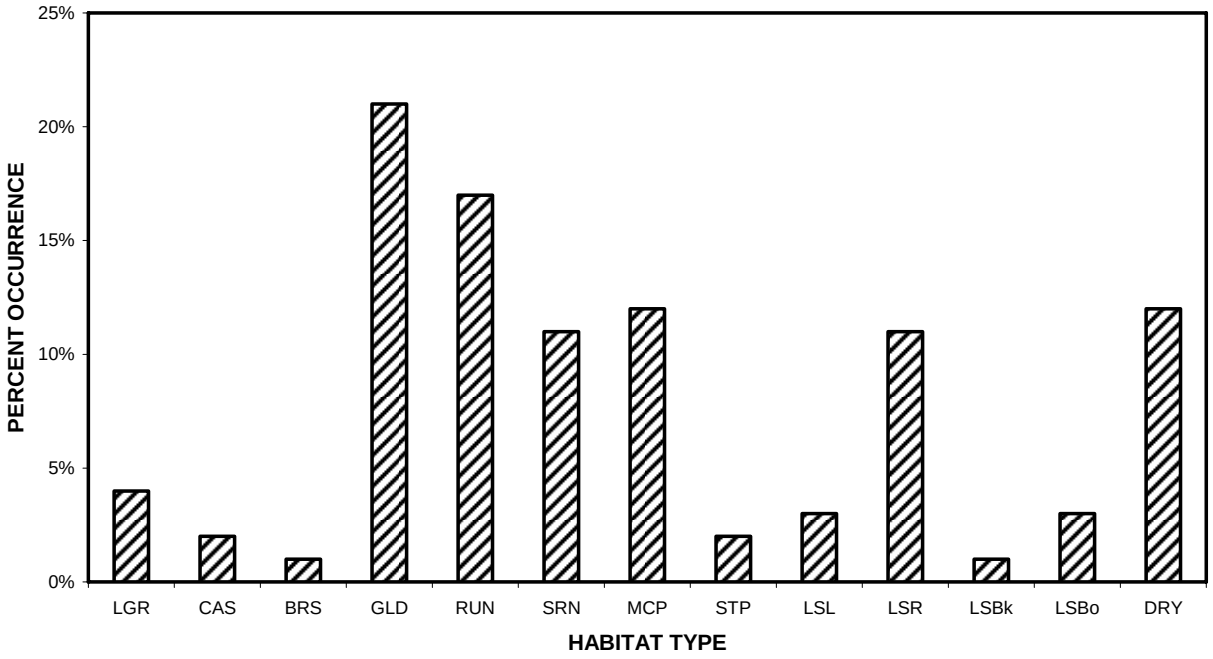
GRAPH 1. Level II habitat types by percent occurrence.

COLEMAN VALLEY CREEK
HABITAT TYPES BY PERCENT TOTAL LENGTH



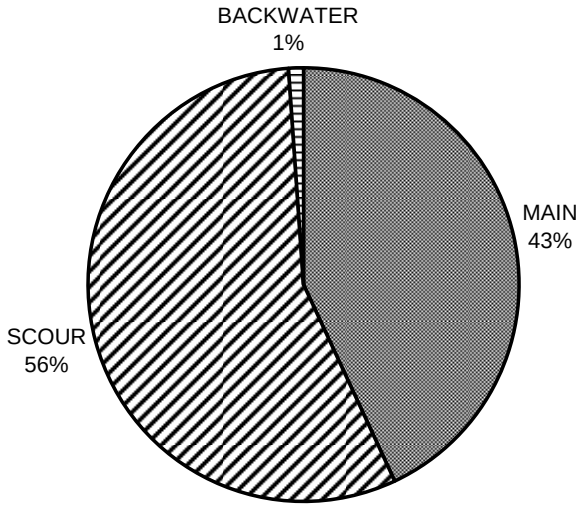
GRAPH 2. Level II habitat types by percent total length.

COLEMAN VALLEY CREEK
HABITAT UNIT TYPES BY PERCENT OCCURRENCE

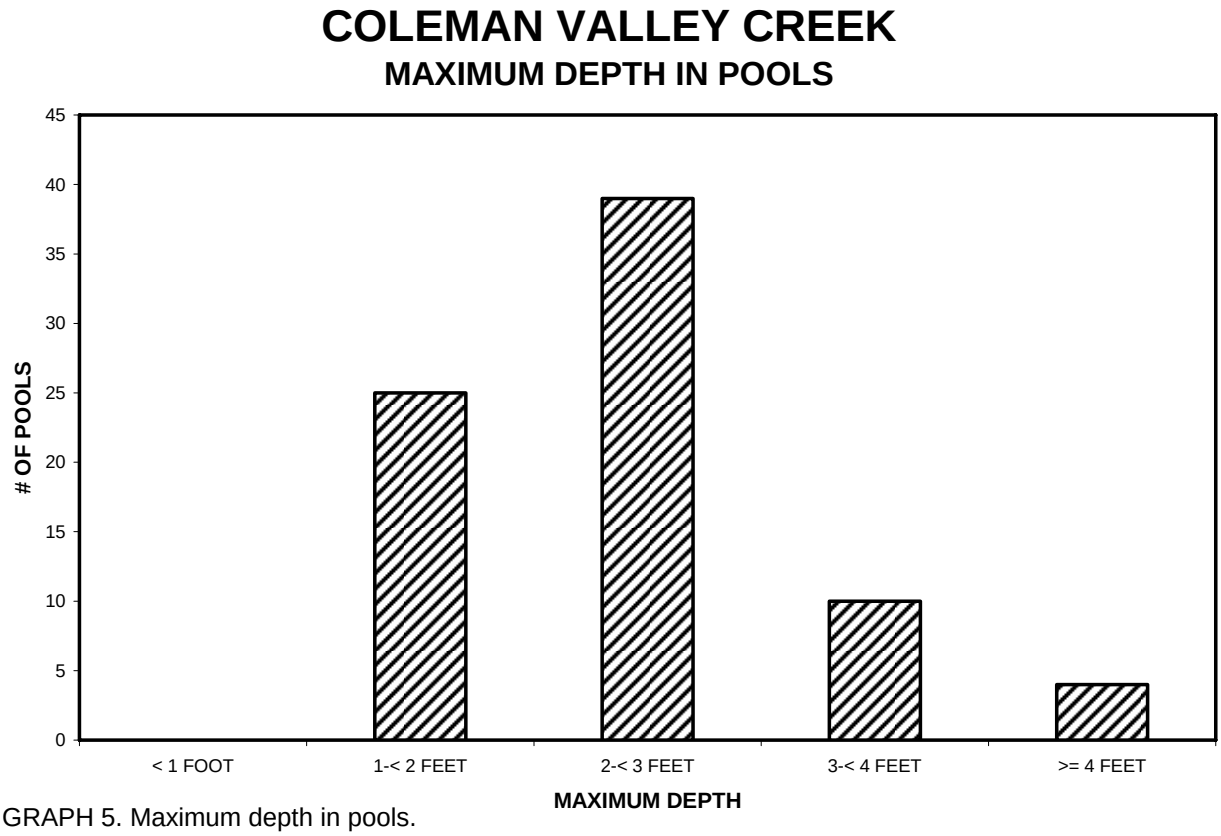


GRAPH 3. Level IV habitat unit types by percent occurrence.

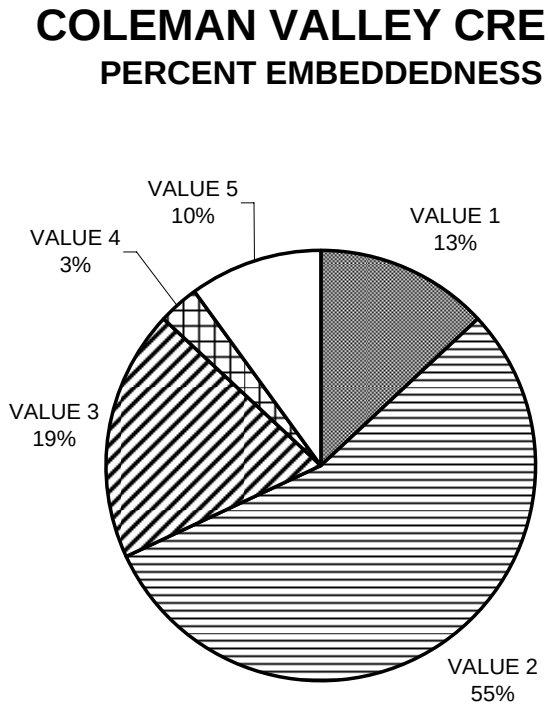
COLEMAN VALLEY CREEK
POOL HABITAT TYPES BY PERCENT OCCURRENCE



GRAPH 4. Level I pool habitat types by percent occurrence.

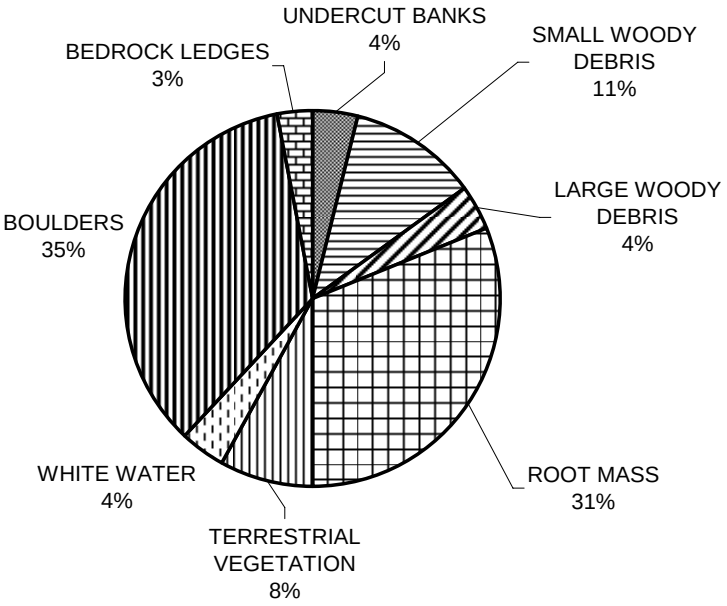


GRAPH 5. Maximum depth in pools.



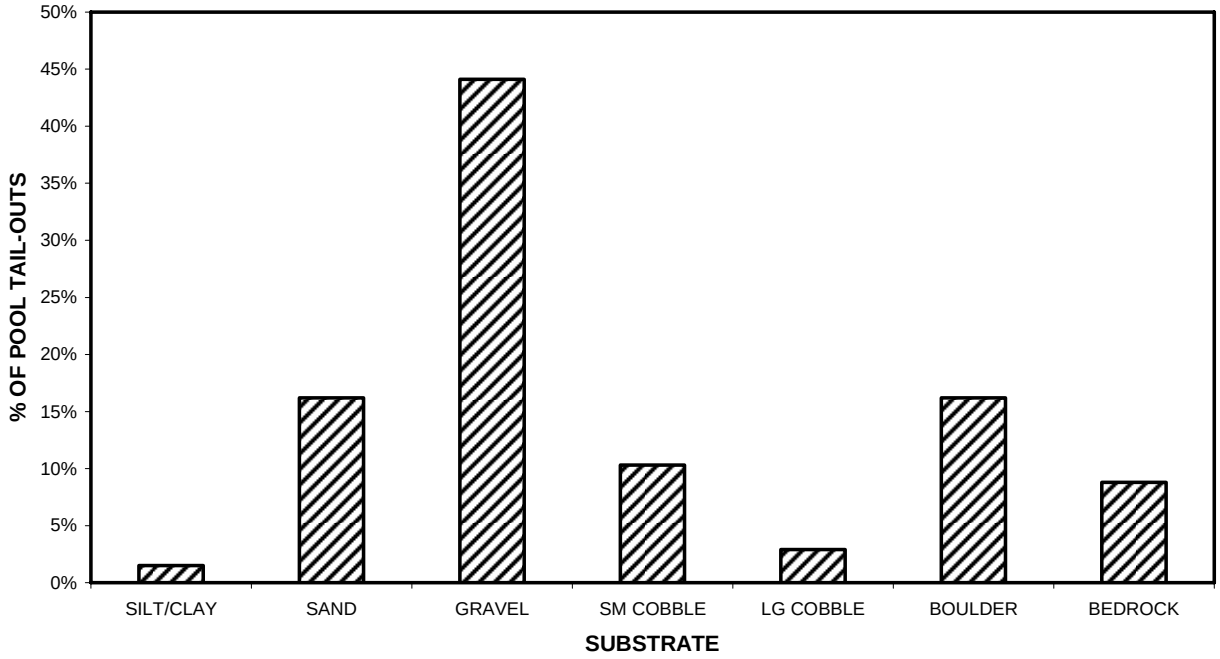
GRAPH 6. Percent embeddedness estimated at pool tail-outs.

COLEMAN VALLEY CREEK
MEAN PERCENT COVER TYPES IN POOLS



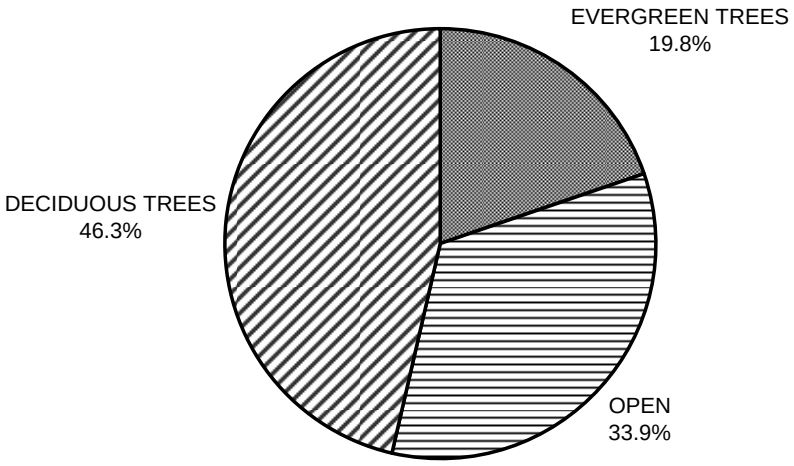
GRAPH 7. Mean percent cover types in pools.

COLEMAN VALLEY CREEK
SUBSTRATE COMPOSITION IN POOL TAIL-OUTS



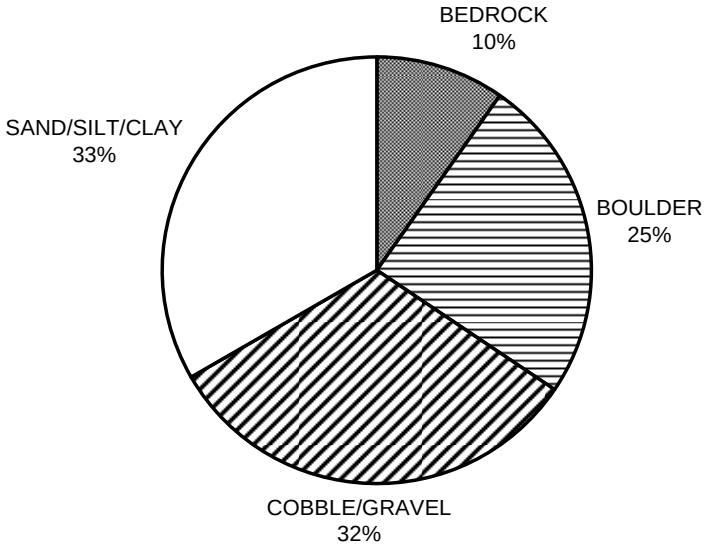
GRAPH 8. Substrate composition in pool tail-outs.

COLEMAN VALLEY CREEK
MEAN PERCENT CANOPY



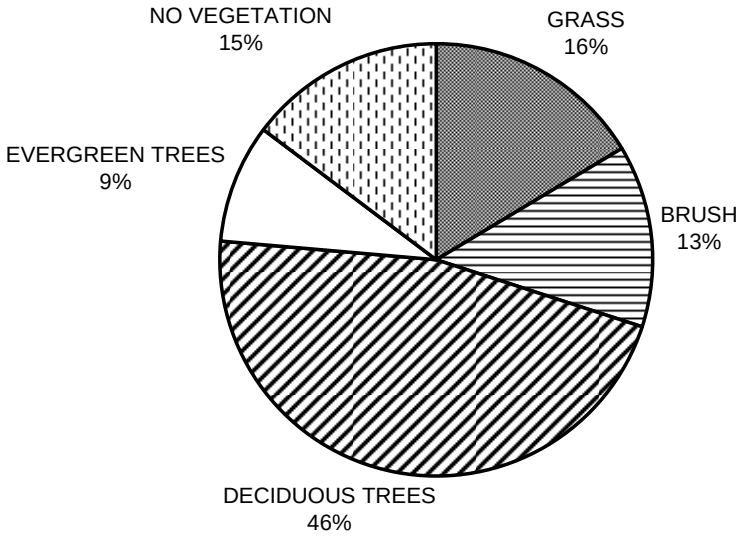
GRAPH 9. Mean percent canopy.

COLEMAN VALLEY CREEK
DOMINANT BANK COMPOSITION IN SURVEY REACH



GRAPH 10. Dominant bank composition in survey reach.

COLEMAN VALLEY CREEK
DOMINANT BANK VEGETATION IN SURVEY REACH



GRAPH 11. Dominant bank vegetation in survey reach.